The area of
Tongatabu, however, probably does not exceed 150 square miles, which on 161
the basis of full-blooded Tongan population, in 1921, gives the average of 65 162
individuals to the square mile, a number probably sufficient for communica- [131]
tion in the traditional way, if the bulk of the population fringed the ancient [491]
highway which ran from end to end of the island. It should be borne in [361]
mind that the ancient population lived largely on farms rather than in villages. [764]
Ancient burials are to-day found in the bush where farms once flourished.

Cook (19, vol. 1, p. 297) mentions an assemblage at an entertainment 175
on Tongatabu Island, concerning which "some of us computed, that, at this 161
time, there were not less than ten or twelve thousand people, in our neigh- 162
borhood; that is, within the compass of a quarter of a mile; drawn together, for the most part, by mere curiosity." Providing the total is not overestimated, this statement would seem at first glance to indicate a larger population for Tongatabu Island than that of the present day. But many people from neighboring islands of Tongatabu and from Haapai and Vavau were doubtless present. In reference to the population of the islands near Tongatabu in 1797 the following quotation from Wilson (65, p. 95) is pertinent: "Passing to the northward of Eoo-âije, we steered W.S.W. to the entrance, then W. by S. and W. up the harbour, followed by the above canoe and several others, which put off from the eastern part of the main island and the islets that lie scattered upon the reef."

The statement of Cook (19, vol. 1, p. 246) that "at least three thousand people" assembled at the entertainments on Lifuka Island indicates a population in 1777 no greater than in 1909 when Lifuka and the neighboring islands Foa and Haano had a population of 3,565. With the rest of Haapai to draw upon as well, a crowd of three thousand people might be assembled readily enough. Cook's description of the island of Mango suggests that the population in 1777 did not much exceed the population of 42 individuals in 1906 and it is of interest to note that he found Uoleva Island, just south of Lifuka, as destitute of inhabitants as it is to-day.

The grouping of people in villages and the consequent desertion of farms 175
as residences has taken place probably since 1773, when Cook (18, vol. 1, 162
361
p. 213) described the country as follows:

> The produce and cultivation of this isle [Eua] is the same as at Amsterdam [311]
> [Tongatabu]; with this difference, that a part only of the former is cultivated, whereas
> the whole of the latter is. The lanes or roads necessary for travelling, are laid out [491]
> in so judicious a manner, as to open a free and easy communication from one part
> of the island to the other. Here are no towns or villages; most of the houses are
> built in the plantations, with no other order than what conveniency requires; they
> are neatly constructed, but do not exceed those in the other isles. The materials of 342
> which they are built, are the same; and some little variation in the disposition of the 175
> framing is all the difference in their construction. The floor is a little raised, and
> covered with thick strong mats; the same sort of matting serves to inclose them on [352]

[TEXT CONTINUED ON PAGE 7]

> the windward side, the other being open. They have little areas before the most of them, 175
> which are generally planted round with trees, or shrubs of ornament, whose fragrancy 342 [352]
> perfumes the very air in which they breathe. [351]

Again, in 1777, Cook (19, vol. 1, p. 314) describes Tongatabu, as he saw 175
it on "an excursion into the country," in the following words: 361

> We found by far the greatest part of the country cultivated, and planted with 311
> various sorts of productions; and most of these plantations were fenced around.
> Some spots, where plantations had been formerly, now produced nothing, lying fallow;
> and there were places that had never been touched, but lay in a state of nature; and,
> yet, even those were useful, in affording them timber, as they were generally covered [643]
> with trees. We met with several large uninhabited houses, which, we were told, [491]
> belonged to the king. There were many public and well-beaten roads, and abundance
> of foot-paths leading to every part of the island. [487]

The nearest approach to a village, observed by Cook was the capital Mua 175
(the modern villages of Lapaha and Tatakamotonga), where the principal 361
chiefs of Tongatabu dwelt, especially when attending the court of the
Tui Tonga.

A map of Tongatabu Island, published in 1810 by Vason (60), although 491
doubtless inaccurate as to details, shows the great road traversing the length
of Tongatabu and the numerous lanes separating the farms.

La Perouse (47, vol. 2, pp. 171, 172) describes the south coast of Tonga- 175
tabu as follows:

> As the wind was to the north, I steered towards the south coast of the island, 175
> which is very free from danger, and may be approached within three musket-shots. 133
> The sea broke furiously all along the coast; but the breakers were upon the shore;
> and beyond them we perceived the most luxuriant orchards. All the island appeared 175
> to be cultivated; the fields, which were beautifully green, were bordered with trees 311
> . . . The huts of the islanders were not collected together in villages, but dispersed 361
> over the fields, like the farm-houses in our best cultivated plains.

In 1793 conditions seemed to be unchanged, for Labillardière (37, vol. 2,
pp. 135, 136, 153) says:

> In advancing to the westward, we went over a vast enclosure formed by palisades, [417]
> the stakes of which, placed obliquely, were pretty close to each other, and in the
> middle of which grew the bread-fruit tree, the plantain-tree, the fan palm, *corypha* [245]
> *umbraculifera*, &c. Farther on, we found, within a fence not near so extensive, a [417]
> small hut, of a conical form, in which we learnt were deposited the remains of a chief [764]
> lately dead; and we were also informed that it was forbidden to enter it.
>
> We then walked, for near a quarter of an hour, along a narrow road lined with [622]
> palisades on both sides: we followed it as far as a very large lawn, where King [491]
> Toobou was shortly to make his appearance. . . .
>
> We soon after entered the fields, where we saw each individual's ground divided
> into small plots, surrounded by palisades, and in a high state of cultivation.

The missionaries who took up their residence in 1797 speak of certain 175
places as the residences of chiefs—for example, Haateiho and Mua (spelled 361 797

Ardeo and Mooa by Wilson). The map published by one of these mis- 175
sionaries (60) is innocent of villages. As to the cultivation of the country 361
they say: "At Tongataboo the country is flat and enclosed, and, though little [797]
cultivated, very productive" (65, p. 385). [311]

By Mariner's time the complete breakdown of the central authority and [712]
the internecine wars had forced people to take refuge in fortresses (*kolo*)
from time to time. This seems to be the origin of the modern Tongan vil- [721]
lages, all of which to-day are designated by the word *kolo*, though none are
fortified. The ruins of old fortifications are numerous. [172]

Although the necessity of living together for protection disappeared com- 361
pletely with the destruction of the fortress of Pea in 1852, villages neverthe-
less persist in Tonga and appear to have come to stay. Christianity and the [795]
copra trade are factors that contribute to the maintenance of village life. [439]

MODERN VILLAGE POPULATION

The large modern villages, such as Nukualofa-Maufanga on Tongatabu, [162]
Neiafu on Vavau, and Pangai-Hihifo on Lifuka Island, represent the acme
of development in village growth and consequently the greatest departure
from the rural distribution of population observed by Captain Cook. These 361
large villages are composed of an assemblage of unrelated family groups. 621
Thus, Hihifo, is said by one informant to comprise three groups of kindred
headed by the chiefs and matapule Tuita, Pouangi, and Tea. In the smaller [602]
villages, however, it seems likely that the inhabitants are bound to one an- [178]
other by blood ties and that these little communities do not depart far from
the grouping of people in ancient times. The tiny village of Siesia, Nukunukumotu Island, is an example. The relationship of the 16 individuals of this hamlet in 1920 are given below.

House 1

1. Kula, father of 5. A *toutai* (navigator or fisherman) and former mayor of Siesia. His wife was Finau of Folaha, Tongatabu, now dead. 361
2. Fatai, son's son of 1, named after brother of 1. 621
3. Maria, wife of 2. A woman of Maufanga, Tongatabu; upon marriage came at once to Siesia to live. 592
4. Solomon Tanaki, son's son of 1 and brother of 2, unmarried, named after brother of 1, by midwife. Born at Siesia. 602

House 2

5. Taani, son of 1, and father of 2, 4, 7, 8, 9, mayor of Siesia.
6. Mary Anna, wife of 5 and mother of 2, 4, 7, 8, 9.
7. Mili, daughter of 5 and 6, about 13 years old. Twin brother dead.
8. Latu, son of 5 and 6, about 16 years old. He and 13 call each other by brother terms. They are of course only cousins. [601]
9. Mary, daughter of 5 and 6, about 9 years old.

In some games the chief is given a handicap over opponents of lesser 622
rank. In the game of dart throwing (*sika mamao*) in which the greatest 526
distance thrown determines the winner, if the chief's dart were almost the
winner, it would be turned over lengthwise so as to lie ahead of the leading
dart. My informant had an impression that the chief's dart might be turned
over three times, that is, the chief be given a handicap of three lengths, but
not more. From this custom originated the proverbial expression *sii kae amo* [538]
(small but successful), which implies that although one has not displayed
much energy or skill in an enterprise yet he has succeeded thanks to the
assistance of someone else.

The *fekesike* method of fishing was never used by anyone but a chief 622
who could muster the necessary numbers required (43), consequently a 226
fekesike rope always belonged to a chief.

Not every chief has the word *tui* (lord) in his title. Various informants 622
were under the impression that the term *tui* in connection with a name indicated 554
higher rank than *eiki* (chief). One informant said that chiefs with
the word *tui* in the title (specifically Tui Haa Teiho and Tui Haa Ngana)
were in line to become Tui Tonga in event of the lack of a direct successor,
whereas a chief like Ulukalala or Malupo was not.

Special rest places, mounds (*esi*), with a shade tree growing on or beside 622
them, were built for chiefs. Sunshade or picnic shelters (*falekakala*, 311
house of flowers) were also erected. The *esi* were given names. (See 25.)

A chief's sitting position is legs crossed and left foot on right knee 622
(*faefakaheka*). When sitting among his inferiors, a pile of mats (*langolango* 516
is provided to raise him above the common level.

In Tonga there seem to have been no official jesters, but at times certain 622
individuals, termed *fakaaluma* or *fakatakataka*, who were considered particularly 522
witty, took it upon themselves to amuse the chiefs. For example, [463]
Kaho, a man of Vavau, acted as *fakaaluma* for Akauola (grandfather of
the present Akauola) and made fun of the people. He would say anything
to make Akauola laugh. On one occasion he had himself tied like a pig
and carried to a feast. My informant did not know whether this man was
appointed. Akauola is one of the modern landed royal navigators (*toutai*).

A warrior who killed ten men and brought the heads as evidence was 622
highly regarded and might be raised to the rank of a matapule or a petty 555
chief (*eikisii*) and be given land; or again he might be given the privilege 701
of drinking his chief's kava when it was called.

Anciently the staff (*tokotoko*) and the fly whisk (*fue*) were used by 622
kings and chiefs but not by matapules. To-day, it is said, anyone may use 643
them. The staff was used formerly not only in walking but to lean upon [481]
when addressing an assemblage. To-day the term *tokotoko* applies to the

Tui Tonga tracts in the Vavau group are: Koloa Island; Vaipoa, Vavau 643
Island; Tamamualoto, Vavau Island; Vakataumai, Kapa Island; Pulinitu, 423
near Haalaufuli, Vavau Island; Hauofa, between Haakio and Lafoou, Vavau 103
Island; Lavengahau, near Ngaakau, Vavau Island.

BOUNDARIES

In Tonga trees and ancient roads commonly served as boundary marks 423
instead of stones, which are too readily moved. Land hunger is one of the [685]
failings of the Tongans and to-day, when a noble dies, his neighbors, if [768]
possible, encroach on his *tofia,* making haste to do so before his successor is appointed and trusting that the new owner will be ignorant of the true
boundaries. Many present day nobles are averse to having their hereditary [659]
lands surveyed by the government surveyor because this would prevent further boundary shifting.

The *ngatae* (*Erythrina indica*) seems to have been the favorite tree for 423
marking boundaries because it grows rapidly. Coconut, *koka* and *buko* 824
trees formed more permanent boundaries, usually replacing the *ngatae* when [137]
it died. I heard that the word *ngatae* is a modern rendering of *ngatahe* which means boundary and anciently designated the tree as well. Thus when the Tui Kanokupolu allotted a piece of land to a follower, he said "Ngatahe," meaning that the follower should mark the boundary by planting *ngatahe* trees.

ABSENCE OF TRUE COMMUNAL LANDS

Anciently there seems to have been no lands that were, strictly speaking, 423
communal. Perhaps the nearest approach to a communal tract was the [311]
malae or green in proximity to the house or houses of a chief, an enclosed lawn which was used as a place of ceremonial meetings, dances, and entertainments, such as boxing and wrestling. As now used, the term *malae* applies to a chief's burial place (the common use in eastern Polynesia) and to the lawn area adjacent to any house.

An example of modern communal tenancy was noted in Lifuka Island. 423
Although the tract (*api*) Fiehua belongs to the Queen, in 1920 it was used 311
as a communal field for the village of Pangai, each man in Pangai having a small section in which to plant sweet potatoes. When the potatoes were [651]
harvested, a number of basketsful were presented to the queen. However, the coconuts which grew in this field were not the property of the townspeople. Copra was made from the nuts by the queen's caretaker, a mata- [245]
pule named [illegible]none, who usually received half of the proceeds, some- [644)
times all

Veamatahau, Vea, from Matahau. T,H,V
Veaniua, Vea from Niuatoputapu. T
Veatama, the child who is a chief.
Veatokelau, the chief from the north, Vea of the north.
Veatoki, a strong chief.
Veatonga, Vea from the south.
Veatoutai, Vea the chief of fishermen. T
Veatupu, Vea the strong; a chief that is distinguished. T, H, V
Veehala, the side of the road; not in step; to step wrong (as in a dance). T,V
Veekalifisi, the feet of the wooden pillow from Fiji.
Veetokelau, the feet that come from the north; foot of the north.
Veetutu, the feet that beat time in the dance. H
Vehikite, something that appears in sight. T,V,NT
Veikune, a good chief. T,H,V
Vela, hot; to burn; to scald. NT
Velevelu, the good that comes quickly.
Velia, itchy.
Velovelo, throw the dart (it was the cry of the warriors when fighting). T
Vesi, verse. T
Vete, to seize the spoil of a conquered foe; to disburden; the name of a fish. T 551
Vetule, to jog along, as one old or weak. H
Veua, two things.
Vi, the name of a tree and its fruit. T, H, V, NT, NF
Viau, something of mine. H,NF
Vika, Victoria. H
Vikaheilala, Victoria of the *heilala* tree.
Vikatoa, a whole *vi* fruit; all the *vi* fruit. V
Vikena, the *vi* fruit that is reddish when ripe. T,H
Vilai, a bean. T
Vili, a gimlet; to drill; to go quickly. T
Viliami, William. T
Vilingia, to be blown away; to be blown. H
Vivi, the name of a grass; dead; stinking. V, NT
Vivili, to feel; to be conscious of. NT
Vola, a fast dye. H
Vuki, something at a distance. H,V
Vulase (a Fijian word).
Vuna, a real chief. T
Vunaila, a chief with a scar.
Vungakoto, the step upon which the mast of the vessel stands. V

THE OUTLYING ISLANDS

Although little was added to the previous knowledge concerning the 128
expansion of the Tongans beyond the limits of the modern kingdom of
Tonga, some light was obtained as to the peopling of some of the remoter
islands of the Tongan Archipelago proper. The islands I refer to in par- [103]
ticular, named from north to south, are Fonualei, Toku, Late, Kao, and Ata
or Pylstaarts. The first is now a hopeless wreck due to volcanic activity. 133
Toku, Late, Kao, and Ata are no longer inhabited. Late and Kao are high [162]
volcanic islands. Ata is high and presumably volcanic. Toku is low and
according to Tongan informants coralline. Most of my information con- 128
cerns Ata. Before taking up that island I shall first discuss the brief
data concerning the others. As will appear, these outlying islands some- [727]
times served as havens for the politically disfavored. (See Harangue about [166]
Mumui, p. 156, in which the poet exclaims, "Exile me to Toku Island.")

Toku and Fonualei were held by a single group of people. Toku seems 162
to have been the residence center and Fonualei the farming center, the 311
Toku people utilizing Fonualei for gardens, perhaps because of the volcanic

[Toku, Fonualei, and Kao Islands]

soil. The population of Fonualei became so large and permanent that a 162
church was erected there. The maximum figures for the two islands were 311
one hundred souls on each in the time of the chief Abraham Tangaloa.
However, the fertile land of Fonualei became a desert waste with the volcanic [731]
eruption of 1846. The people removed to Toku in time to avoid loss of life. 162
Later the entire Toku population was moved to the Vavau group proper 166
by the missionaries, for convenience in church attendance. Their descen- [797]
dants seem to reside principally at Utulei, Pangaimotu Island.

The Toku people were political exiles from Haamea in the central dis- 727
trict of Tongatabu. The people of Haamea fought the Hihifo people dur- 166
ing the reign of the Tui Kanokupolu Mataeletuapiko and were overcome. 175
They fled to Toku under the leadership of the Haamea chiefs Tukutukuholoi-
pangai, Ofakehokomaikaetau, and a third chief. Talafaiva, daughter of the
Tui Haa Takalaua and (later?) wife of the Tui Tonga Uluakimata I
(Telea) was with them. The refugees were all of the Haa Takalaua and it [669]
seems likely that the struggle between Haamea and Hihifo was but a part
of the Tui Kanokupolu's effort to eclipse the Tui Haa Takalaua. It is said
that people from Makave in Vavau went to Toku to help the chiefs from
Haamea. When the Haamea refugees arrived at Toku they found Niuato-
putapu people in possession. These were ordered to leave and did so
peaceably. This settlement of people from Haamea must have occurred
in the seventeenth century if the references to Mataeletuapiko and Tala-
faiva are correct.

The son of one of the refugee chiefs from Haamea became the ruler
of the Toku people under the title of Tangaloa. The last Tangaloa was
Abraham Tangaloa of Utulei, Pangaimotu Island. The Tui Kanokupolu
appointed the Tangaloa. The second Tangaloa bore the personal name of
Katainatoa.

The god of the Toku people was incarnate in the *tukuhali* or sea snake, 776
I could not learn the name of the god or the title of the priest. The Toku 825
incarnation of the god fell into a well. The well was in consequence filled 823
and a new one dug for use.

Tradition names the top of Kao Island, Haapai, as the site of a village, 823
a statement which is pure fiction, as I learned by climbing to the summit, [173]
3380 feet above sea level. A woman there one day said she was going for [361]
a walk. She intended to visit one of the coral islands which seemed to lie
so close below that one could step over to it. She threw down her bundle
of mats, then followed it, and was dashed to pieces on the rocks below. This
tale is evidently told to illustrate the extreme steepness of Kao.

The ancient settlement on Kao was near the shore, not at the summit. 361
The shore settlement was probably on the northwestern side, nearest Tofua.

7: McKern A-4,5. (1920-1921) 1929 OU9 Tonga OU9

EXCAVATIONS

LOCATIONS

172 Available sites for archaeological excavations in Tonga are of two kinds,
114 old burial places and kitchen middens. The burial places, though plentiful
enough, are so definitely remembered in the folk history of the people that,
[769] to their minds, excavation would be no less objectionable than the desecration
of a modern cemetery. The kitchen middens are so few in number and
[121] represent such small accumulations of debris, both in area and in thickness,
that only the determination to leave no possible source of information untouched made their investigation desirable. In the end, the discovery of pottery alone justified the amount of time and energy expended.

Exceptional conditions permitted the opening of five old burial places. One *faitoka* on the island of Motutapu and two langis on the island of Tongatabu were deliberately opened. One unknown *faitoka* was entered in excavating what was reported to be an old god-house *paepae,* on the island of Pangaimotu. The fifth burial place was accidentally uncovered in excavating a kitchen midden at Nukualofa.

The kitchen middens excavated are: 1 at Nukualofa; 1 on the island of Pangaimotu; 2 in caves on the island of Eua; 1 in the town of Mua; 1 on the island of Motutapu. All of these are in the Tongatabu group; no kitchen middens of any description rewarded the search in the Haapai and Vavau
[128] groups. The results of excavations are included in the following brief descriptions.

PANGAIMOTU SITES

Kitchen Middens

133 The island of Pangaimotu, situated about 2¼ miles northeast of Nukualofa, has an area of less than one square mile and a maximum elevation of
311 about 15 feet. Although uninhabited, the island supports several very productive yam and fruit gardens, cared for and harvested in season by inhabitants from the main island.

133 On the southwest coast of the island, the sea has encroached upon the land to produce a perpendicular, earthen bank above the beach line, 2 to 6 feet in height and several hundred feet in length. Inland from this exposure, the land surface dips downward, indicating that the sea has cut in to the very center of the original embankment. The foundation of the mound seems to have been a sand dune. The upper strata, to a varying depth, are composed
172 largely of ash, charcoal, marine shells, and burnt coral rock. Near

423 There is a certain measure of inequality among the
427 villagers in regard to leased *api*. Thus thirty-six men are
each lessees of one *api* of the smaller size. Six men are each
428 lessees of one big *api*; three men each rent two *api*; one
man rents three *api*. The number of *api* that a man may
rent depends somewhat on the vagaries of inheritance. This
may be shown by the case of Biukala who controls three
api on Pangaimotu and one in Tongatapu. In August, 1939,
Biukala rented the last free *api* on Pangaimotu. He also
controls the *api* of his dead father which in turn passed to
his mother who now lives in Nukualofa. Thirdly he controls
the *api* of his mother's mother (her husband is also dead).
A fourth *api* in Tongatapu Biukala has inherited from his
deceased father who was a Tongatapu man. Biukala pays
rent each year for all four *api*. When his mother or his
grandmother dies, Biukala may decide either to control their
api exclusively for his own advantage or else arrange for a
[425] close relative to use the land. He could also, if he wished,
[651] relinquish the land by defaulting on his taxes.

423 It is obvious from this that as long as a young man
wishes to remain in the village of Pangai, he cannot
427 necessarily look forward to controlling by lease an *api* on
the island of Pangai. Thus, according to Biukala, the male
children of a man who rents but one *api* have now no hope
of renting *api* for themselves on Pangai island. When they
reach adulthood, they will either have to make arrangements
to share the produce from an *api* controlled by another or
else seek land away from their home village. Biukala
[311] estimates that one *api*, properly cultivated, could produce
[241] ample food for at least twenty cultivators and their households,
although with this type of relatively intensive cultivation
the amount of copra obtained from the land would
become negligible.

423 The location of the plantations traditionally associated with residents of Pangai village is given by the numbers in Figure 1.[A] Of the 81 plantations surrounding Pangai, 53 are controlled by present residents of the village (44 by Pangai men, 5 by Pangai women, 1 being associated with the village school and 1 with the Free Wesleyan Church), 30 by past residents of the village. Of this last number, 13 are now resident in Neiafu, 13 in other nearby villages of Vava'u,

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[A] [See category 116, p. 6--Analyst]

plants. The above staples would be planted as required 241
in such a way as to keep the amounts and proportions fairly constant.

Such is the fertility of the Pangai soil that only a small 241
part of a man's *api* is used for garden-purposes. Thus 423
Biukala controls three *api* which total about fifty acres. He 311
allows a relative to garden two acres of one *api*. The remainder of this *api* is given over to bush and coconuts. The second *api* is not cultivated but is used for coconut-production. On the third *api* Biukala gardens about three acres for his own household needs, taking coconuts from the remainder. From these three *api* Biukala thus supports his own household and that of a relative as well as securing, under optimum conditions, about twenty-five tons of copra each year. Most villagers with their normally small *api* can easily produce enough food for their households (if they are reasonably industrious according to Tongan standards) and can also expect to obtain up to five tons of copra each year.

Such also is the fertility of the soil that there appear 241
to be few beliefs, if any, of a magical nature associated with 789
garden cultivation. The villager knows full well that most of what he plants will grow. Insect pests, high winds and hurricanes, excessive rain or excessive dryness will affect his harvest from time to time. But it is convenient today to look upon these natural events as God-sent against which
the skill and hopes of man avail nothing. Similarly the [242]
influence of government agricultural experts and of agri- [654]
cultural teachers in the government and mission-colleges tends to inculcate a scientific fatalism where religious fatalism leaves off. Neither agricultural art nor religious excuse, taken singly or together, leaves much ground for specifically magical belief or practice. Garden magic therefore, is conspicuously absent in the emotional and intellectual make-up of the average Pangai cultivator.

LIVESTOCK 231

Most households in the village own at least several 574
pigs. These are necessary not so much for ordinary food- 527
consumption but in order to fulfil feast obligations whenever these fall due at times of birth, marriage, death, visits of

434
family. He has an *api* of about ten acres, part of which he 511
uses for gardening, part for the growing of coconuts and 592
bananas. His income from the sale of copra and bananas is [311]
about £10 a year. His fixed expenditures for twelve months [423]
were:

Government rent for *api*	8s 0d
Government poll-tax	£1 16s 0d
Church contributions	£2 0s 0d
Total	£4 4s 0d

This leaves Sesoni about £6 a year for expenditures on clothing, kerosene, soap, matches, tobacco, and extra foods for his household. The money buys very little of these extra items. But Sesoni seems to get along well enough.

A second record is that of Biukala. His household
consists of four adults and five children. His is a higher [428]
standard of living because of the fact that he has come to [427]
control by inheritance and immediate renting three *api* in [423]
Pangai and one *api* in Tongatapu and has had some initiative
in growing vegetables for sale to the Europeans in Neiafu.
He is a young man, a graduate from the government college
in Nukualofa, with definite ideas of raising his status and
that of his children. In this he is a-typical. In other words, [156]
he is not the easy-going villager. He is a man with a mission in life. His budget, therefore, is not typical of the other villagers. It may be given in detail, however, to show by contrast what a high standard of living is for a Pangai household.

TABLE 8.—INCOME AND EXPENDITURE
7 months (June-December, 1938)

Income	£	s	d	Expenditure	£	s	d
Sale of copra	6	3	0	Poll-taxes	1	8	0
Sale of garden produce	10	19	6	*Api* rents	1	0	0
Sale of tobacco leaf	3	8	6	Church gifts	3	8	0
Sale of pigs	1	17	0	Son's birthday feast	3	7	6
				Food, seeds, clothing	2	19	3
				Christmas gift to mother	5	0	0
Total	£22	8	0	Total	£17	2	9

Cash balance £5 5 3

which this would have entailed. The one given by 643
Tukuaho was a useful one, and for the present I became 645
to the Tongans not a Minister of the Crown, but "*Koe
tugata fakahinohino*" (The expounder—of the dark ways
of civilised man).

The Privy Council over, we had time to look about us.
The island at this point is barely half a mile wide: every 133
rood of it seems to be under cultivation, from the back of 311
the town to the edge of the rocks on the Liku upon which
the ocean-rollers, driven before the steady trade-wind, beat
unceasingly. The Europeans of the place live in a row of 563
stores on the beach, each hungry for copra, each fearing 366
to give the natives credit, yet not daring to refuse lest [452]
they take their custom to a neighbour; and each, when
he has given credit, mortified by seeing his debtor pass
his store to sell his copra to a hated rival. There is the
agent of the great Hamburg firm, the agent for M'Arthur
& Co., a free-lance or two, a carpenter, and the Customs
officer of the port, who brings up a large family on £100
a-year. The only friendships in this heterogeneous society 563
are mere alliances against a common foe, and as they are
all by instinct against the Government, and can now have
the exciting sport of setting the king against his Ministers,
there is something very like reconciliation among them.

On Sunday we went to church in a driving rain-storm, 796
but, notwithstanding the weather, the little building was
filled. The women in their native finery looked infinitely [292]
more respectable than their brothers and husbands, who
had donned threadbare coats and trousers in honour of
the day, but had stopped short of shoes. The king was [643]

173 Uvea,[1] from Futuna,[2] and even from Haamoa[3] and the far
175 islands to the North.[4] No man knows whence he derived
643 his power, unless indeed he was a descendant of the gods
[648] themselves, of Tangaloa, of Ikuleo, and of Mau'i, but this
[651] is hidden in the clouds of the ages. The people of
[776] Tonga were so thick in the land that the commands of
[203] the king were carried from one end of the land to the
other, the people lying on their mats and shouting the
[203] message one to the other. It was the time of "*Fanogonogo
Tokoto*" (making proclamation when reclining).[5] And
173 seeing that all men were his slaves, and that the world
175 held none that did not do him homage, the Tui Tonga put
643
466 heavy burdens upon the people, and made them drag great
349 stones and set them up for a memorial of his greatness;
and the people neglected their yam plantations to do the
tasks set them by their king, so that there was a great
scarcity. And when they hungered they began to cry
out against their king, for men are ever hard to govern
when their bellies are empty.

173 Now there came a Tui Tonga, named Takalaua, who
175 was strong and harsh, and was greatly feared of the
643 people. Every day he sent out his fishermen from Mua
[224] into the bay, and they would land on the islands to
arrange their nets. One day they landed on Ata, near
Euaiki, and when they sailed the two old people who

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[1] Wallis Island.

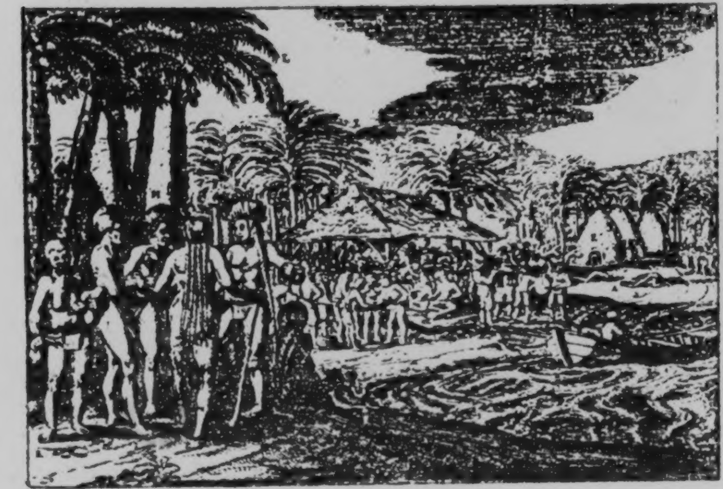
[2] Hoorn Island.

[3] Samoa.

[4] Gilbert Islands.

[5] At the time of Tasman's visit in 1643 there seem to have been no
[361] villages. The land was highly cultivated and fenced, and each family
[311] lived in its own plantation. It is more probable that the *Fanogonogo*
[161] *Tokoto* referred to this than that the population was ever much greater
than at present.

and were repulsed with heavy loss. Thus one fact was 175
learned—the strangers could not be openly assailed with 177
safety; and the fame of Schouten's prowess, recorded in a 604
rough poem, may have served to protect his great countryman Tasman.



Schouten and Lemaire buying provisions in Futuna, 1616, showing ancient mode of wearing the hair. Vide Appendix II. A
(Reduced from a rare Dutch plate in the possession of Dr Corney.)

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On January 27, 1643, Abel Tasman anchored off Hihifo in Tongatabu. The natives crowded on board his ships to barter provisions for iron, but beyond pilfering when unobserved, they did not annoy their visitors. A chief, probably the Tui Tonga, Tabuoji, entertained them very
hospitably, and invited them on shore. They found that 175
the country was cultivated like a garden. It was divided 177 361
by neat reed fences into plantations, within which stood 311

A /See pp. 402-403 for explanation of picture--Analyst/

731 their concrete church, still standing like an island
[346] among the general wreckage, as a proof of
Divine warranty, a little tempered perhaps by
reason of a gaping rent in the tower. The
people were living in the open air, crawling into
the cover of their ruined houses to shelter from
[152] the rain. Poor souls! they bore their misfortunes
[245] with a light heart, though the crop of orange
trees, from which they get their living, were
uprooted, and the cocoanuts would not recover
[245] for two years. Every boat in the island was
busy bringing food from the less stricken villages,
and the men were saving something from the
wreck by turning the fallen cocoanuts into copra.

Next day we set forth in the ship's boats to
648 survey the German coaling-station in the bight
[133] of the harbour. The shore is here a coral reef,
[134] upheaved about fifteen feet above the sea. The
[311] soil is shallow, but, like all limestone formations,
very productive, and covered with plantations
648 and cocoanut trees. On the further side was
504 the open sea, for this part of the harbour is
a mere breakwater, tapering away to a boat
passage in the bight of the harbour, where the
land is only two furlongs across. The Germans
had done themselves handsomely, and had
allowed no concern for the welfare of the

Tongan landed chiefs are land hungry. The old practice 423
was to claim as much as possible of the neighbouring lord's 178
territory upon his death. Careful surveys now being made 425
by the government are fixing permanently the boundaries
of hereditary lands, so that expansion of one's holdings at [428]
the expense of some minor heir who is unfamiliar with his [656]
inheritance will soon be no longer possible. It is of interest
to note that the chief who would be Tui Tonga, if that office
had not been abolished, has by legal procedure in recent
years secured the return of lands improperly claimed by
others.

Euro-American culture has had a hand in transforming 361
the Tongan population from a rural one to a village-dwelling 177
one. The transformation had its beginning at the end of 178
the eighteenth century when civil war forced the people to [166]
leave their farms and seek refuge in fortresses. Thus village
life seems to have begun. Then came the missionary and a
great wave of religious enthusiasm which served to rein-
force the new village ties rather than to dissipate them. The [245]
copra trade and the scant attention required for the coconut
trees doubtless, in a negative way, has helped to perpetuate
the village life. The result is that modern Tonga is a country
of villages. The farms surround the villages at varying 241
distances and the villager makes periodic excursions to his 311
eight-acres of farm land. All of this has not been beneficial 178
to agriculture. Much land once cultivated intensively has
become bush. There are signs, however, of revival. A pro-
minent chief is inducing his people to give up village life
and dwell on their farms. Recently introduced agricultural
fairs seem also to offer a much-needed stimulus. It seems
likely that the next few decades will see a return to the
intensive cultivation of heathen days. The series of food 241
plants has been much enlarged by introductions. 178

Tracts of farm land are sometimes given the names of 103
foreign lands with which the Tongan has become acquainted
in school. More frequently, however, tracts within the vil-
lages are given such names. The Tongan seems to have a 484
considerable interest in geography and he likes to travel. [181]
His geographic poems amply attest this. This love of travel [823]
and of topography is still rife. The monthly steamers and
the sailing passenger boats carry many Tongans from one
part of the archipelago to another or to more distant Samoa
and Fiji. Modern vessels continue to cater to the Tongans' [178]

134

without spelling, probably owing to deficiencies of potash. There are 135
no minerals in Tonga, and no forest resources of value. 137

The islands in the volcanic chain are of little account. Only Niua 133
Fo'ou, Niuatobutabu, and Tafahi are large or safe enough to be [311]
peopled, and they contain less than a tenth of the population. Two of them, however, have attracted some fame, Niua Fo'ou because of its Tin-Can Mail, and Falcon Island because of its periodic disappearances. This jack-in-a-box island is associated with an active volcano, whose eruptions occasionally leave a raised surface of ash and scoria which sea and rain later wash away.

The eastern chain is divided into three groups, Tonga Tapu in the 131
south, Ha'apai in the centre, and Vavau in the north. Tonga Tapu 162
contains about half the Kingdom's habitable area, and half its people 311
(16,234). Ha'apai has nearly the same population as Vavau, but less
than half its habitable area.[2] Each group has a serviceable port, Nukua- 504
lofa in Tonga Tapu being the most important and also the capital.

Climatically[3] the Kingdom is well favoured, since it lies in the zone 132
of the southeast trades, and has no orographical obstructions to cause rain and high humidities. The tropical Niuas have much the same rainfall and temperature as Apia and Suva, but the other groups have

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[2] The following statistics illustrate the size, distribution, and density of the population (1939 Census) 161
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Group	Population	Tongans	Habitable Area	Persons per sq. mile	Percentage of Tongans
			sq. miles		
Tonga Tapu	16,234	15,324	134.8	120	47
Ha'apai .	7,483	7,383	24.3	308	22
Vavau . .	8,199	7,957	56.1	143	24
Niuas . .	2,214	2,198	20.6	108	7
TOTAL . .	34,130	32,862	235.8	145	100

[3] The following climatological statistics (supplied by the Director of Meteorological Services, Air Department, New Zealand) illustrate in outline Tonga's principal climatic characteristics: 132

	Nukualofa	Vavau
Annual mean sea-level pressure (mbs)	1014	1013
Annual mean air temperature (°F)	74	78
Annual mean daily maximum temperature (°F)	80	82
Annual mean daily minimum temperature (°F)	68	72
Average annual rainfall (ins.)	63.45	77.57
Percentage of winds between south and east	72	60
Average wind force in morning (m.p.h.)	8	6
Average wind force in afternoon (m.p.h.)	10	7
Annual average relative humidity (a.m.)	79%	77%
Annual average relative humidity (p.m.)	73%	—
Annual mean of sea temperature (°F)	77	79

21: Simkin U-5 (no date) 1945 OU9 Tonga OU9

The chief barrier to this development seems to be a general satisfaction of the commoners with things as they are. They have always been content to leave things to the chiefs, and have no serious grievances to stimulate them to political energy. Democratic institutions are seldom real or stable if they drop from the clouds; they become rooted in a society only when its people have learnt to appreciate and operate them, as a result of struggles to remove hardships. In Tonga progress towards political democracy is retarded, not so much because the present government is rapacious of power, as because it is productive of popular good. 642 000 642

AGRICULTURE AND LAND USE[4] 241

The Tongan is a peasant, cultivating his compact holding in his own way, subject only to the easy and sensible requirements of the land laws.

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[4] The following tables provide a statistical summary of the nature of Tongan agriculture: 245

DISTRIBUTION OF FOOD TREES (1939 Census). 311

Group	Coconuts	Bananas	Pineapples	Other Food Trees
	%	%	%	%
Tonga Tapu . .	39	46	43	39
Ha'apai . . .	26	22	20	7
Vavau	26	23	26	35
Niuas	10	9	11	19
Total for Tongans	3,059	638	314	875
Total for Kingdom	3,260	682	335	890

DISTRIBUTION OF PRINCIPAL CROPS (1939 Census). 244 241 311

Group	Yams	Kumalas	Tapioca	Other Plants
	%	%	%	%
Tonga Tapu . .	55	57	42	28
Ha'apai . . .	14	25	38	22
Vavau	27	5	13	40
Niuas	4	13	8	9
Total for Tongans	1,504	600	1,245	1,671
Total for Kingdom	1,610	647	1,309	1,842

DISTRIBUTION OF LIVESTOCK (1939 Census). 231 311

Group	Pigs	Poultry	Goats	Cattle	Horses
	%	%	%	%	%
Tonga Tapu . .	39	36	44	78 (a)	60
Ha'apai . . .	29	26	23	3	15
Vavau	17	24	30	17	20
Niuas	15	13	4	1	5
Total for Tongans	19,120	49,744	3,484	1,024	5,016
Total for Kingdom	19,754	50,378	3,572	2,634	5,179

(a) The actual number is 2,058 of which 1,549 are owned by Europeans

241 Before the civil wars he used to live on his farm, but today it may be [461] some distance from his home in the village. Four days' not too strenuous work a week is usually enough to provide for his family's needs. A few friends may join together to do work on each other's farms, but arrangements of this sort are quite irregular.

241 About half of a typical farm consists of an unkempt area devoted to ● 311 the permanent cultivation of coconuts, and the remainder of a number of small plots cleared from a general area of bush and weeds. Less than half of it will be in use at any time since spelling is practised to conserve 241 fertility. Yams, bananas, and corn are planted on the better land, as are the tapa trees, a species of mulberry from whose bark the women fashion a coarse cloth. Taros thrive on less fertile soil, while kumalas and tapioca do well on comparatively poor land. Bananas and tapa trees are left to grow for three years on the same spot, but the food plants are shifted every year. Intermingled with these major crops may be found pineapples, paw-paws, breadfruit, mangoes, kava, tobacco, cotton, chillies, ginger, candlenuts, citrus fruits and a few European vegetables. Somewhere on the holding it is usual to raise sugar cane for thatch, reeds for house walls, pandanus for mats and baskets, and various shrubs for scents and dyes.

A farmer in Tonga Tabu will have about 250 yams, 200 tapioca plants, 100 kumalas, 100 banana trees, and 50 pineapple plants. These figures are fairly typical for the whole Kingdom but some variations occur. In Ha'apai holdings are smaller and more carefully cultivated, with fewer yams and more tapioca; in Vavau there are fewer kumalas but more breadfruit and corn; in the Niuas breadfruit replaces yams as the major food crop.

231 Primarily an agriculturalist, the Tongan makes little use of animals. He keeps perhaps half-a-dozen fowls, three or four pigs, and occasionally [492] a goat or cow for butchering rather than for milking. Usually he owns a horse but does not use it for any farm work except carting. Sheep 262 are not raised at all. To relieve the monotony of a largely vegetarian diet he resorts mainly to fish, which is plentiful everywhere.

For a moderate amount of work, then, the Tongan's allotment 434 provides him with food, housing materials, tapa cloth, mats and baskets. 241 Besides these necessities it affords him a few small luxuries such as kava, 434 tobacco, scents, dyes, and native substitutes for soap. When he requires cash to pay taxes or rent, to meet Church subscriptions, or to buy a few store goods, he has only to harvest some of his copra or bananas

From the standpoint of his own needs, therefore, the Tongan is an 241
efficient enough farmer, but if European standards are considered his 434
farming leaves much to be desired.

One of the first things to impress the outsider is the enormous waste 311
of land, for, apart from a few clearings for the food plants, the farm is 241
largely given over to prolific weeds. Equally glaring are the primitive 241
methods of cultivation. Machetes, spades, push hoes, and an occasional [412]
fork are the only implements used, and no appreciation is shown of the use of animal manure or of any other fertiliser. Reflection will suggest, however, that these conditions may not be entirely due to agricultural backwardness. Intensive cultivation would exhaust the soil, and in the absence of local supplies fertilisers would cost more money than the Tongan could afford. Weeds may rob the soil of moisture, but they do not exhaust its fertility and have at least the merit of preventing soil erosion. Undoubtedly much more could be produced from the average farm, but probably only if fertilisers, cattle and implements were provided on a scale beyond the resources of most farmers.

To a certain extent the general faults of Tongan farming may be excused. It is less easy to justify the defects of its particular branches, apart from a recognition that they may arise not so much from a lack of ability or energy as from a lack of agricultural training and capital. Many of the crops and especially fruit are ravaged by serious diseases and pests, which the farmer does little to control beyond avoiding to
plant obviously damaged material. The copra is of relatively poor 245
quality, commanding inferior export prices because it is produced, 251
harvested, and dried in a very haphazard way. The Tongan usually gathers it only when he needs money for some specific purpose, and this casual attitude, together with the infestation of weeds about the trees, leads to a considerable wastage of nuts. There are few hot-air driers in use, the greater part of the crop being rather carelessly sun-dried.

Perhaps the worst of the Tongan farming is animal husbandry. Not 231
only is the stock inadequate and of poor quality, it is also badly cared for. Systematic efforts to provide feed are rare, the animals being left to forage for themselves. It is not surprising that they are scraggy creatures, too often suffering from serious diseases. Tuberculosis is
particularly rife in both cows and pigs. There is little attempt either to [232]
control these diseases or to improve the stock by breeding.

245 vast amount of moisture in the soil during the
242 period of growth. In addition to which, no sooner
has the fruit ripened, than the parent tree is cut
down, and its juicy trunk and roots are left to
rot upon the surface. The process of decay is
rapid; and meantime the young sucker-plants,
which spring up from every parent stem, reach
maturity in swift succession, to be cut down in a
similar manner. These banana plantations are
allowed to remain during one or two seasons, after
which the ground is replanted with other products,
(244) or with the yam. As a rule the yam is not replanted,
in the same ground, until the lapse of two or even
242 three years. This system of resting the land, and
permitting the bananas to rot, unquestionably
311 answers all the purposes of ordinary manuring;
but it necessarily involves the occupation of a
much larger quantity of land, than would be
required, were the principles of European agriculture adopted.

245 Perhaps there is no sight more distinctively tropical than that of an extensive banana plantation. In these islands all the varieties of the tree flourish in highest perfection. The plantain, (*Musa sapientum,*) so greatly used and esteemed in the West Indies, is not much thought of by the Tonguese; but all the other sorts, included in the *Musa paradisiaca,* or banana family, are extensively cultivated. The fruit hangs in single bunches upon a strong stem issuing from among the leaves. Each bunch will weigh from thirty to even eighty pounds. The fruit is of various colours, and of great diversity of form, according to the description of tree planted. It is usually long and narrow, of a pale-yellow, or dark-red colour, with a yellow or

[Eua]

Of the two former, nothing need be said here, as 797
they were small and unimportant; but a passing
notice of Eua may complete our view of the Tonga
group.

Several visits to this island, at different periods, 241
enabled us to form a good opinion of its physical
character and capabilities. Having been styled the
"granary of Tonga," we expected to see it in a
very high state of cultivation, but we found
nothing peculiar in it in this respect. At present it [177]
has but a very small number of people upon it; [504]
and these, being cut off from foreign intercourse
through the want of a harbour, have no inducement
to cultivate the soil beyond the necessities
arising for their own support. The beauties of the [134]
island are great, and its richness of soil for agricultural [311]
purposes unquestionable, but these lie undeveloped.
In former days, when the population of 174
the country was greater, large supplies of produce 438
may have been carried to the adjoining main island 731
of Tongatabu, especially in seasons of famine
caused by drought or hurricanes. From the [133]
effects of the one the snug and lovely valleys and
ravines of Eua would be sheltered; while its flowing
rivulets and streams would counteract the evil
consequences of the other, at times when Tongatabu
itself might be lying in temporary desolation.
Hence the dependence of the Tongans upon Eua,
at such times, for food; and hence, probably, the
reason why it was styled, magniloquently, their
"granary."

One of the pleasantest Missionary trips I ever 797
had was to this island, in company with the Rev.
George Daniel, in the year 1851. We each took
our own boat and boat's crew. The wind being

This sample is too small, but for what it is worth in the absence 434
of a larger sample, the correlation coefficients between labour and pro- 592
duction and between land and production suggest that money income 423
varies more readily with the quantity of labour available than with the 433
amount of land; i.e. a man is more likely to obtain a greater income by working harder than by increasing his land holding.[27] Uneven as it is, therefore, the distribution of land exerts only a minimal influence upon the amount of money obtained. This may partly explain why an uneven distribution of land tends to be left undisturbed; but this latter tendency may be tolerable only at the present level of economic development and may tend to disappear at a higher level.

6—LAND USE AND LABOUR

The legal provision relating to the planting of coconuts at intervals 311
of 30 feet is, by and large, followed consistently on the majority of the 245
api I have seen. Amongst the coconut trees there would be food and 244
cash crops of several types, bananas, taro, yams, sweet potatoes, *manioke*, and even pineapples and water melons. In general, these are not planted in sharply defined plots but are interspersed one amongst the others, so that in an intensively cultivated *api*, members of all species would be found on each square chain of ground. This is more or less the general pattern, although there may be varying degrees of emphasis upon particular crops in particular parts of the *api*. Varying the pattern of emphasis would appear to me to play a similar role to straight out rotation.

The coconut trees belong to the planter but are heritable with 423
the land on his death or secession; and as their normal productive life [428]
is 50 or 60 years, they may change hands several times during their
lifetime.[28] But the other crops, requiring from three to eighteen months to mature, are the property of the planter, whether he be the legal holder of the land or not.

The distinction between permanent and annual crops makes it 423
easier to understand all the sharing of *api* referred to in the previous 311
section. For while the current holder of an *api* owns the coconut trees 241
and other permanent resources, he need not have the whole *api* under 476
the less permanent crops at any one time.[29] This gives him room to permit a friend or relative to plant for himself a crop of taro or yams

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[27] My calculations produced correlation coefficients of $r = .32$ and $r = .54$ for land and labour respectively.

[28] The evidence of the 107 *api* which I studied shows that several of them had changed hands twice or thrice in the previous five or six years.

[29] The Beagleholes quote a man who estimated that up to twenty cultivators and their families can live off one *api*, Beaglehole 1941:18, but it is not clear whether this refers to an ordinary *api* of 8¼ acres or to one of the larger ones which may be up to 20 acres in area, Beaglehole 1941:17. In this connection it may be interesting to note that in a village of about twenty households which I studied in Fiji, the total area covered by food crops in various stages of development was found by detailed measurement to be 8.1 acres for all households.

423 on a section of it, always on the understanding that the holder has the 311 right to demand it back after the crop is taken out. No rights other 241 than those of cultivation accrue to the borrower. Although such an 476 arrangement involves definitely no rent in money or in kind, it is advantageous to the allotment holder in that the section so lent is [427] thereby kept free from weeds and heavy undergrowth.[30] The fact that no rent is involved actually strengthens the hand of the holder when he demands his land back. As far as rights to land are concerned, the same principles apply when a man uses part of the *api* legally held by his brother, or when a number of brothers use the *api* of their father.

592 Individual land holders can call upon several types of *work groups* 241 to assist them in working their land. The most important work group [476] is the household which, under the leadership of the head of household, performs most of the day-to-day tasks of cultivation. Its importance lies in its relative permanence. For while the other work groups considered below come into operation only in connection with the heaviest tasks such as clearing and occasionally planting, and therefore tend to be relatively impermanent, the household deals with the constantly recurring need for weeding and other minor tasks, and is the only unit which can engage in long term planning on the basis of its own self-interest. It is the basic unit of production and consumption; and its members are bound together by common interests which transcend the [476] economic sphere. Its significance needs no further elaboration. But beyond this unit, three other types of work group are found: the *tou ngaue*, the *kautaha* and the *toù lulaga*.

476 The *tou ngaue* is a working party which may comprise anything from two or three men to about eight or nine, the members of which 241 work co-operatively for each of the members in turn. The members are [462] not fed by the person for whom they are working as in the case of Pangai reported by the Beagleholes,[31] but each feeds himself and then goes back to work. In this way they achieve the ends which demand co-operative work, but avoid the encumbrance of preparing food for others. At the time of my investigation, there were three *tou ngaue* in the village under investigation. Their memberships were 3, 5, and 8 men respectively.

Kinship does not appear to play an important part in the formation 476 of these groups. While there are occasional *tou ngaue* which have a 241 large proportion of members who are kin, the principle of kinship 602 does not specifically enter into the definition of the *tou ngaue* as such. When asked whom he would choose to be members of his *tou ngaue*, a man once replied, "My friends". But when pressed further to define what he meant by "friends", he said, "Those who work hard on my plantation". "Would you choose your brothers or close relatives particularly?" "No". The relationship seems therefore to be a purely economic one.

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[30] The sort of arrangement involved in the work group known as the *tou tu'u* described by the Beagleholes is particularly interesting in this regard, Beaglehole 1941:33-34.

[31] Beaglehole 1941:32.

592 share with unrelated households in preference to sharing with related
241 ones.[32]

476 One of my informants deliberately played down the role of kinship
602 in land matters. He argued that landless people share the use of the
592 land of their friends, people with whom they are on specially good
241 terms; people who are closely associated in other spheres of activity,
476 such as the religious or the economic; and above all one tries to obtain
572 the use of lands which are specially fertile or which lie near to the
602 village. While "friends" here may include relatives, this is not
necessary. Such an explanation would, of course, cover the cases which,
from other points of view, appear to be inexplicable random variations;
and at the same time show how "open" relations through the land can be,
giving the land tenure system much of its flexibility.

474 Thus it has appeared that kinship plays no great part in the
602 organisation of labour, but a perceptibly greater part in the handling
311 of the land resources available to the community. But kinship not only
[476] affects the people's relation to their land in the way already indicated;
it also does so through inheritance. The rules of inheritance have
already been given, but it may be added here that it is through
inheritance that particular individuals come to control a duplication
of *api*;[33] that females can hold land; and that the title to *tofia* holdings
is passed on from one generation to the next in the chiefly line thus
perpetuating and strengthening the most important factor for political
control in the kingdom.

592 In the village under investigation, however, the range of kin recog-
602 nized for these purposes does not seem to extend very far. While
there are clusters of households between whom there are specially
strong ties of kinship, the great majority of them recognize such
relations with only one or two other households. The count taken, from
one household to the next, reveals that in most cases these relations
are based on affinal ties. The range of connections over the whole village
is as follows:

TABLE 3

DISTRIBUTION OF KIN AMONG HOUSEHOLDS

No. of Other Households containing Kin	No. of Households
0	18
1	21
2	28
3	16
4	11
5	8
6	4
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[32] The reasons for such preference are obscure, but the explanations given to me were largely in terms of economic self-interest. See, for instance, the section on work groups, p. 108.

[33] See, for instance, Beaglehole 1941:18.

655 hard-board, cabinet-making, ship's gear and housing), as well as developments
471 in private industries such as cigarette and tobacco processing,
handicrafts, tailoring, boat-building, bread-making, and in government
service industries, communications, electricity and water supplies and
457 mechanical engineering. Until 1956, Tonga maintained a favourable
overseas trade balance without incurring a national debt. Since 1965,
464 moneys have been borrowed from Britain for development plans. But
these developments are not sufficient to employ the increasing numbers
of young men migrating to Nuku'alofa seeking work. For example, in
1956, 2.41% of the Tongan male population over fifteen years was engaged
in "part-manufacturing and processing"; by 1966 this percentage had
rised to 2.78% of the adult Tongan males, an increase of some 192 persons,
but Tongan females employed in this category decreased over the same
period by some 77 persons, that is, in the decade following 1956 the total
number of Tongans employed in "part-manufacturing and processing"
industries rose by only 115 to 597 persons. The "services" branch of the
economy absorbed an increase of 568 Tongans, "transport and communications"
65, whereas Tongans employed in "commerce" dropped
from 786 to 353, a loss of 214 workers. The number of non-agricultural
labourers rose during this period from 192 to 786—a gain of 594 workers.
[563] Comparable figures for non-Tongan residents in Tonga in 1956 and 1966,
show decreases in the number of persons employed in "part-manufacturing
and processing" industries (a decrease of 83 persons), "services" (down
63 persons), "transport and communications" (down 24 persons) and
"commerce" (down 103 persons). These figures conform with the Tonga
Government policy of gradually replacing non-Tongan workers with
Tongans.

SUMMARY AND CONCLUSIONS

161 Rapid increases in the Tongan component of the population are
162 occurring: about 38% in ten years; this is producing a very youthful
population in which over half of the population is under sixteen years of
[163] age. Population expansion is due not to a rising birth rate (which is
[165] fairly constant at 3.24%) but to a rapidly decreasing death rate (in 1966
the death rate reached an ~~all-time~~ low of 0.29%).

423 Pressures on land are beginning to be felt but are not yet acute because
it is comparatively easy for any Tongan to obtain access to land for
subsistence purposes. Pressure on the '*api* system as it now stands is very
great with possibly well over half of the men eligible for land without
● 311 land or at least without security of tenure. Possibilities for intensification
of land use have scarcely been sought; diversification of crops and scientific
methods are, with the exception of the Coconut Replanting Scheme, as
yet confined to research stations; large tracts of land belonging to the
nobility remain officially unallotted; several high islands are unsettled;
larger allotments could be subdivided with the introduction of intensive
362 methods. Pressure on housing is not yet acute except in Nuku'alofa, but
592 the Tongan administration seems to have adopted a European norm of
one "family unit" to one household in spite of the traditional custom of

part Sand but not without some Coral rock. This place is much 122
better sheltered than where we last lay, but between the two is a 133
place much better than either.[1]

Lefooga and Ooleva are divided from each other by a reef of Coral 133
rock which dryes at low water so that one may walk from the one to
the other without weting a foot. This last island is as barren as the 137
other is fertile, producing nothing but a few scurvy trees and shrubs
and wholy without Inhabitants.[2] 361

TUESDAY 27*th*. At day break the next Morning I made the Signal to 122
wiegh, and as I intended to attempt a passage to Anamocka by the
SW in amongst the islands, I sent the Master away in a boat to
Sound before the Ships. But before we could get under sail, the wind
became unsettled and made it unsafe to attempt a passage this way
till we were better acquainted with it or had a steady wind. I therefore
lay fast and made the sign' for the Master to return, and afterwards
sent him and the Master of the Discovery, each in a boat to
examine the Channels as far as they could allowing time to return
on board before dark. The wind was unsettled all day and blew in
squals with some Showers of rain. About Noon a large sailing Canoe 648
came under our Stern in which the Indians on board told us was
Fattafee Polaho King of all the Isles;[3] we had reason to doubt this, but 643
they stood to it and now for the first time told us that Feenough was [634]
not the King. As it was my intrest as well as inclination to pay my
Court to all these great men, without enquiring into the legality of
their titles, I sent a boat to bring him on board as I understood he
wanted to come. He brought with him as a present to me two good [431]
fat hogs, though not so fat as himself, for he was the most corperate
plump fellow we had met with. I found him to be a Sedate sensible
man, he viewed the Ship and the several new objects with uncommon
attention, and asked several pertinent questions one of
which was 'what brought us to these islands'.[4] After he had satisfied [644]

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[1] The anchorage, one takes it, off Pangai, the little township of Lifuka, on the shores of a distinct bay (see Chart XLVI). But though the anchorage is good, Cook would have found an embarrassing number of reefs and shoals interposing.

[2] 'Olaiva although as large an island as Laifooga, is intirely uncultivated & almost un- [311]
inhabited, only a few fishermen live in it. it seems a sandy poor soil in general, but we saw
that formerly it had not been intirely neglected, there being appearances of former [131]
cultivation, we understood that from terrible Lightning all the possessions of the inhabitants
were destroy'd, some kill'd, & the state of the remains of part of the coconut trees we
saw, was occasion'd by that lightning; since which no one had chose to make plantations.'
—King, 27 May.

[3] Fatafehi Paulaho, 36th Tu'i Tonga, c. 1770–84. Fatafehi was a 'family name' of the Tu'i [551]
Tonga—not a 'surname', but one much used among the members of his chiefly family.

[4] 'he now ask'd our business there, where we came from, & where we were going, questions which had never been put to us before; to satisfy him, a map was produced & explained to him, & by his explaining it again to his followers, he shew'd that he was

122 with beating about amongst the islands and shoals as they were and
determined to get to an anchor some where or a nother if possible.
[133] While the boat was absent, we attempted to turn the Ships through
the Channel, between the Sandy isle and the reef of Ogodoo, in expectation
of finding a moderate dept[h] of Water behind them to
anchor in, but meeting with a Tide or Current against us were
obliged to desist and anchor in 50 f^m^ water with the Sandy isle
[648] bearing EBN one mile distant. We lay here till the 4th during this
time we were several times visited by Fattafee the King, Toobow-
[649] eitoa, and people from the neighbouring island[s] came off to trade
[439] notwithstanding it blew very fresh most of the time. The Master was
sent to sound the Channels between the islands to the Eastward and
I landed on Ogodoo to examine the island and take a View of the
134 Shoals or reefs about it. I walked all over it, the north part is low
land, the soil composed of Sand and Mould. The South end is elevated
[133] and the soil a red sandy clay without a stone, every part is
● [311] cultivated and there are some pools of dirty Water on the low ground
[312] and all of them more or less brackish.

Wed. 4 On the 4th at 7 AM we wieghed with a fresh gale at ESE and stood
Thur. 5 away for Anamocka where we anchored the next Morning nearly in
122 the same place where we lay before. I landed soon after and found
the Inhabitants very busy in their plantations diging up yams to
439 bring to Market, they were now in the greatest perfection and we
procured a good quantity for pieces of iron. Before I returned on
241 board I visited the several places where Mellon seeds & plants
177 had been planted and had the Mortification to find that the most
of them were distroyed by a small ant,[1] but [the] Pine-aple plants
Frid. 6 I had planted were in a flourishing state. About noon the next day
164 Feenough arrived from Vaughwaugh he told us that several Canoes
122 laden with hogs &c^a^ that sailed with him from the island were
lost in the late blowing weather and every soul in them perished;
but as this melancholy tale seemed not to affect any one of the
Indians, I did not beleive it; yet it might be, for it had blown hard
for these parts, in so much that the King and others at Ogodoo durst
not venture to Sea when we did, but desired I would wait for them
at Anamocka which was the reason of my anchoring there the second
Sat. 7 time. The following Morning the King and all those who had been
643 wind bound with him arrived, I was at this time a shore with Feenough
648 and left him to visit the other; who I found seting with a few
634 people before him, but as several came to pay their court to him

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[1] The ant in Tonga is called *lo*; but there are more than one species, so that it is impossible to identify the criminal. [136]

SUNDAY 18th. The wind E . Moderate breezes with good weather. 114
The Gunner was employ'd to trade on shore and purchas'd a good
many hogs, plantanes &c but the greatest supply we had was a 439
present which Fee'nou made the Captain of a vast quantity of Yams, [634]
Plantanes, Sugar cane &c and two hogs, which was shar'd between
the two ships. Amongst other things we purchas'd yesterday a fine [431]
green Turtle of above 300 Lib., & to day the decks were so crowded [648]
with the natives who came to barter or were incited by curiosity that
it was almost impossible to stir. [609]

MONDAY 19th. The wind Easterly. Gentle breezes with fine weather. [132]
We continued to barter with the natives on shore as yesterday and a
great number were on board.

As we wanted to obtain some knowledge of the country some of us 609
mention'd it to Fee'nou, who sent a person as a guide and to protect
us from any insult from the natives. We travers'd nearly the whole 114
island of Lai'fooga and found it in several respects superior to Anna-
mooka. The plantations were both more numerous and extensive and 311
we found large spots well planted with the Morus papyrifera (paper
Mulberry),[1] but in many places towards the sea, especially on the east
side, the country is still waste owing perhaps to the sandy soil, as it is
much lower than Annamooka or its surrounding isles. Towards the [134]
middle of the island the soil is better and much better inhabited than
the other parts, for we met here with very large plantations, fenc'd in [162]
in such a manner that the fences running parallel to each other form'd [241]
fine spacious roads that would appear an ornament in the most [417]
civilizd countrys. It however labours under the inconvenience of [487]
having no good water that we could see, for though we found several
ponds the water was either very brackish or stinking, and in some 312
large holes in the coral rock which is seldom above two or three feet
from the surface it was no better than common sea water. At one 223
place we saw an artificial mount rais'd to a considerable height with
an arbour of low trees neatly contriv'd, under which our guide made 349
us understand people sate to catch pigeons.[2] At another place was a
house four or five times as large as the common sort with a large area 344
of grass before it which seem'd a place for the people to resort 764
publickly to;[3] and near the landing place we saw one of their burying 349
grounds, which was a mount two or three feet high coverd with
gravel and had four or five small huts on it, in which they said the
bodys of some of their principle people were interr'd.[4] Most of the 000

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[1] *Broussonetia papyrifera*, Tongan Hiapo.

[2] Tongan *mala'e*.

[3] One of the mounds called *sialupe*.

[4] A *fa'itoka*.

114 which is the small isle next to it, that we might go in a direct course
for Anna'mooka and found it safe as far as he went.

On a report of the Indians that Hoolaiva though almost as large
311 as Lai'fooga was neither inhabited nor cultivated I went on shore to
[225] see it, and found their account true, for there is neither the least mark
[226] of culture or habitation upon it except one hut where a person resides
to catch fish and Turtle. It is rather uncommon that it should be in
this situation when that next to it is so perfectly cultivated and the
inhabitants can walk from one to the other at low water, for though
the soil is quite sandy and there is not good water upon it why might
not the Cocoa palms, an article so usefull here (and which thrive in
the midst of sand), be planted or indeed other articles, for it produces
all the trees and plants found in a natural state on the other islands
133 with the greatest vigour. The east side has a reef like Lai'fooga from
whence we could see no island except Ta'taffa, and the west side has
349 a bending at the N part where there seems good anchorage. We found
an artificial mount like that at Hapaee raisd as high as some of the
223 surrounding trees with an arbour upon it for catching Pigeons.

Three large sailing Canoes with people who seem'd strangers has
643 come to the ship, in one of which was a person nam'd Futta'faihe[1] or
Poulaho who said he was chief of Amsterdam & all the islands we
[634] had seen or heard of. On mentioning that Feenou had pass'd as such
with us, he said that he was indeed a person of power in Amsterdam
and often sent on warlike expeditions to the other isles but deny'd his
643 being first in rank. If weight of body could give weight in rank or
142 power Poulaho was certainly the most eminent man in that respect
we had seen, for though not very tall he was of a monstrous size with
[644] fat which render'd him very unwieldy and almost shapeless. He had
straight hair and his features differ'd a good deal from the bulk of the
[576] people; but these differences would not have been sufficient to convince
us of his superior rank had we not seen some marks of respect
paid him to which we were strangers, for on giving him something to
eat two of his attendants fed him and the rest turn'd their backs while
643 he was eating. He made the Captain a present of a hog or two and a
[648] quantity of red feathers which he had heard we esteem'd, and in
return he had a piece of printed linnen and some other things. In the
[431] evening he went on shore to Laifooga, and to show that his corpulence
[501] had not render'd him wholly inactive he took a large paddle with
which they scull in the fore part of the boat and handled it dexterously
[177] enough, but he soon tir'd of the excercise. The Captain went on
shore after him and found that all the people on shore brought in the
[439]

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[1] Fatafehi.

114 water, and we had an oppurtunity time enough to warn our consort
of the danger by firing three swivels.

In the fore noon we attempted to work up towards Hafaiva (which
is the largest isle hereabouts) between Pootoo poo'tooa & a shoal that
lyes NE from Kotoo, but making little progress and the same weather
being likely to continue, we came to an anchor at noon in fifty
fathom a coarse sandy bottom about a mile WbN from Pootoo
poo'tooa, Fotoohàá bearing nearly NNE, Kotoo SWbS, and the shoal
to the NE of it SSE and SE. The Discovery also came to soon after a
[429] little to the NE of us. Several Canoes came off from Ha'faiva with
Cocoa nuts & Plantanes and in the morning we sent the pinnace on
[481] shore to Kotoo with our Indian guests, who were so heartily tir'd of
their short Voy[age] that they had once prepar'd themselves to swim
[262] to it. Their greatest distress was with respect to their food, for they
were not fond of Pork dress'd after our manner and liv'd chiefly on
Yams. In the evening we caught a large Snapper of twelve or fourteen
Lib. and a Grooper of the same size.

132 MONDAY 2^{d}. The wind SE. Fresh breezes with cloudy weather in the
forenoon, but afterwards clearer. In the forenoon the Captain went
648 on shore to Kotoo, which is scarcely accessible to boats from the coral
reefs that surround it. It is not more than a mile and a half or two
133 mile long and not so broad. The NW end is low like the islands of
Hapaee, but it rises suddenly in the middle and terminates in reddish
clayey cliffs at the SE end about thirty feet high. The soil thereabouts
is of the same sort as in the cliffs but in the other parts it is a loose
[311] black mould. It produces the same things as the other islands and is
[162] tolerably cultivated but is thinly inhabited. We saw Annamooka
from the highest part of it and the Capt^{n} thought he perceivd a clear
137 passage about Toong'ooa and the other isles towards that place. Our
people were employ'd in cutting some grass for the cattle and we
177 planted some Melon seeds with which the natives seem'd much
pleas'd and inclos'd them with branches. On our return to the boat
312 we met with two or three ponds of water but it was very salt, and
764 near them was one of their burying places that was much neater than
those which were seen at Hapaee.

Several Canoes came from the different islands to barter their cocoa
439 nuts, plantanes &c and we observ'd that almost all of them as well as
164 the inhabitants of Kotoo were affected with a violent cough and
slight sore throat, which also made its appearance on board for two
days past, perhaps from the sudden change to and continuance of the
bad weather.

55: Anderson D,T-5 (1777) 1967 OU9 Tonga OU9

114 the two Ships while working in, with whom we traded for hogs, fowls
439 & vegetables only as the other articles had been prohibited by the
Captain as at Annamooka.

132 WEDNESDAY 11th. The wind SE. Moderate breezes with cloudy
weather. In the forenoon we pitch'd a tent just by the house mention'd
114 yesterday, which is almost the only one here as the country
[311] near it is not at all cultivated. The horses cattle & sheep &c were
afterwards sent on shore and a party of marines with their officer to
312 protect the people. We discoverd two or three ponds near the place
but they had all very bad water, though we found one on Pang'ia
motoo that had rather fresher water than any we have met with
amongst the islands, but rather dirty from the little care taken of it
by the natives.

439 A good many Canoes came off & barterd Yams, Cocoa nuts and
a few hogs but they were not near so numerous as yesterday, though
we expected a much brisker trade here than any place we had been
at from its greater extent.

132 THURSDAY 12th. The wind SE. Gentle breezes with very fine weather.
On the evening we arriv'd here the Captain brought on board a
648 person who had attach'd himself to him as a friend when he touch'd
at this island in 1773, and another who had done the same with
643 Captn Furneaux, who commanded the Adventure. Amongst other
[887] things they mention'd a person nam'd Maree'wagee,[1] who they said
was of the first consequence in the place and as they were understood
superior to Poulaho, to whom he was related, but so old that he liv'd
643 in retirement and yet was held in great veneration. It excited his
648 curiosity so much that he proposd yesterday to Poulaho that he
should pay him a visit, which the other readily agreed to and offer'd
to accompany him, at the same time saying he would send previous
notice to Maree'wagee that such a visit was intended him. The
Captain accordingly set out in the pinnace this morning carrying
some things with him as a present, and Captn Clarke joind him in
643 one of his own boats. We went round Makka'háȧ to the eastward, and
then turning to the SEward according to Poulahos directions row'd
648 up into a spacious bay whose entrance from the east side of Hȯólaiva
133 to the opposite point seems to be about two miles, the breadth within
that three and the depth near four, but it was so full of shoals that we
found it difficult to get up with the boats. The east and west sides are
low, with some creeks running into the last farther than we could see
edgd with mangroves, but at the bottom or SE part the land rises to

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[1] Maealiuaki.

blind with a disorder of his Eyes. It is probable he precedes the other 643
in rank as he certainly posses'd what we might call the seat of honour, [164]
sitting under the tree and fronting us as we walk'd up, while the other
sat aside, and indeed it appeard that he was rather disappointed by
our addressing Mareewagee first & paying most attention to him.

SATURDAY 14th. The wind Southerly. Gentle breezes with fine 132
weather. The people on shore employ'd as before & those on board
mostly in the hold. The natives brought a good deal of fruit and some 114
hogs off & a brisk trade is carried on at the tent. We had a visit from 439
Poulaho who now lives constantly at the house or Ma'laee by the
tent, I believe with an intention to superintend or see that no mischief 643
is done by his people. The Captain made him a present of some things
but neither of the other chiefs came off as they had promis'd yester- 648
day. He entertaind our people at night with a dance at the tent, and [535]
to the surprize of every body the unwieldy Poulaho endeavour'd to
vye with others in that active amusement.

A Canoe went to the Buoy where our boats lay and stole an iron 648
pin belonging to one of them, for which we confin'd one in irons who
was found in the Canoe though not the principal, but the iron being
return'd in the afternoon he was set at liberty.

SUNDAY 15th. The wind SE. Moderate breezes with fine weather. In 132
the forenoon some of us walk'd to the westward of the tent and found
the country totally uncultivated for near two miles, though quite 311
coverd with trees and bushes in a natural state growing with the
greatest vigour. Beyond this is a pretty large plain on which are some
Cocoa trees and a few small plantations that appear to have been
lately made, and seemingly on ground that has never been broke in
before, but it seems to preserve the same appearance still farther on.
We found that several of the principal people, as Maree'wagee, [342]
Too'bou, Fee'nou & some others had erected temporary huts to live [643]
in while they remaind here, near the path which leads through the [634]
uncultivated part immediately west of the tent. Near the creek which
runs to the eastward of the tent the land is quite flat and partly 133
overflown by the sea every tide. When that retires the surface is seen [136]
to be compos'd of coral rock with holes of a yellowish mud scatterd
up and down; and towards the edges where it is a little firmer are
innumerable little holes, from which issue as many small crabs of two
or three different sorts which cover the place as flies on a carcase, but
are so nimble that on ones approaching they disappear in an instant
and baffle even the natives to catch any of them.

At this place is an artificial work which shows these people have 349

648 of people brought a good many fish which were chiefly mullet, and
431 others carry'd small ones stuck on branches as at Mareewagees
though more numerous in a kind of procession. They also brought a
643 small Turtle and afterwards a great many more Yams, all of which
with a piece of cloth, a mat and bit of red feathers were given as a
648 present to the Captain by Poulaho, besides two hogs which were
535 carry'd up and fasten'd to crown the two piles of Yams. About one
o'clock they began the Mai or dances, the first of which was almost a
[643] copy of the first we saw at Mareewagees house. The second was conducted
by the Toobou, who also danc'd there, and had four or five
women in it who went through the several parts with as much
exactness as the men. Towards the end they divided to leave room
for two men who excercis'd their clubs as mentioned in the first
648 dances, and in the third which was the last two more did the same.
526 The dances were succeeded by wrestling and boxing, and one man
entered the lists with a sort of club made from the stem of a Cocoa
411 leaf which is firm and heavy, but could not find one that would engage
him at so rough a sport. At night we had the Bo'mai repeated,
535 in which Poulaho himself danc'd, but neither these nor the dances in
648 the day were so considerable or carried on with such spirit as those at
643 Mareewagees, which proves that in this as well as other countrys
there are private men able sometimes to give entertainments superior
to their Kings.

132 **SUNDAY 22.** The wind Easterly. Fresh breezes with cloudy weather.
The people unemployed. Some of our Gentlemen set out yesterday
114 morning to see the interior part of the island, and after walking some
[133] way met with a lake or Lagune which they cross'd in a Canoe, and is
probably an arm running from the Bay mentiond before to the westward
as they did not see its communication with the sea. They then
[311] cross'd to the opposite side of the island, some parts of which they
[609] found very well cultivated, and stay'd all night but found the inhabitants
not very willing to supply them with provisions though
[648] they treated them civilly in other respects. On returning back to day
one of them had his gun unexpectedly snatch'd from him by some of
the people that follow'd them, and another trusting a young man to
carry his lost it by the other setting off though he had carried it many
miles.

132 **MONDAY 23.** The wind from NE to NNW. Moderate breezes with dull
cloudy weather, a close air and in the evening a good deal of rain. In
114 the morning the cutter with the Master and the Discoverys cutter

[1777]

226 furnish'd, and wading up to the middle within the seine directed it
slowly under water where they saw any fish, and rais'd it up pretty
114 quickly, bringing the fish when the[y] caught any in it. We got a few
mullet from them & then row'd to the bottom of the bay where we
landed on going to see Mareewagge, from whence we proceeded to
764 Poulahos house which was but a little way off. Almost close by it we
found a Fya'tocka or burying place much more extensive and
seemingly of more consequence than any we had seen at the other
islands. It consisted of three pretty large houses situated on a rising
ground or rather just by the brink of it, with a small one at some
764 distance, all rangd longitudinally. The middle house of the three first
was by much the largest, and plac'd in a square 24 paces by twenty
349 eight raisd about three feet high, with the surface coverd with shingle
stones and the whole bounded by large flat stones of hard coral rock,
properly hewn, plac'd on their edges, one of which measur'd twelve
764 feet in length, two in breadth and above one in thickness. The others
were placd on little mounts rais'd artificially to the same height and
532 coverd with gravel, one of the huts, contrary to what we had seen
[349] before, being open on one side which we enterd & found coverd with
shingle, with two rude wooden busts of men, one at the entrance the
other farther in, the last of which from its appearance had been there
perhaps several ages. On calling to some of the natives who had
follow'd us to the ground but durst not enter here, to enquire what
they were intended for, they made us as sensible as we could wish that
they were merely memorials of some chiefs who had been buried
764 there.[1] A[t] the foot of the rising ground there is a large area or plat of
137 grass with different trees about it, amongst which are several of those
call'd Etóá very large, which resemble the Cypress & have a fine
effect in such a place. There is also a row of low palms near one of the
houses & behind them is a ditch in which was a vast number of old
baskets.

361 We travers'd the greatest part of the country about the bottom of
the Bay which is call'd Mooa,[2] and found it perfectly cultivated for
[311] above a mile back from the sea, and full of inclosures made by such
fences as were seen at Ha'paee but they were more extensive and had
[565] finer roads in the interspaces. The habitations within these inclosures
are very numerous and belong chiefly to some of the principal people
351 of the island, many of whom reside at this place. Each of them has a
342 proper entrance or door, generally higher than the fence & of a
417 sufficient breadth, which opens in the same manner as one properly
hung upon hinges, behind which is a pretty large spar that rests with

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[1] Cf. Cook, p. 139, n. 1 above.

[2] Mu'a.

the large end against a stone fix'd in the ground for that purpose, and 351
the other being push'd against the door serves as a strong bar, which 342
makes it as necessary to rap here at the door as at a gate in England
before you can enter an inclosure. In a great many of them there is a [417]
smaller inclosure within, this also often with a door, where the house
of the principal person is immediately plac'd, and near it or very
often in the outer one houses of an inferior sort for servants and
dependents. There are sometimes several little places again within [247]
this that have fences and houses, but communicate freely with each
other, and in most there is commonly a pretty spot of short grass,
though of no regular figure, before them with sweet smelling shrubs
call'd Ma'eele[1] and Hooe[2] planted up and down and some other trees
that produce beautifull flowers. The outer inclosure has commonly [245]
such things as they often want planted in them, as Cocoa nut trees
or some plantanes and bread fruit, but no considerable plantations of
Plantanes or Yams.

Beyond this a mile or two we generally found the Plantations more 311
extensive but open, and still farther on a great quantity of uncultivated land coverd with grass as high as the Knee. Our guides said if we advanc'd that way we should still find a waste uncultivated country, or as they call it Váȯ,[3] but they probably did it only to save themselves a little fatigue, for some miles beyond this the land seem'd to rise a little higher and had a great many Cocoa trees, both signs of its being cultivated. It could also be observ'd that even in this place the soil was good, and it is probable many of the spots only lay fallow, for we saw two or three large plantane fields that had lately been
broke in from such ground. It is remarkable that when on the highest 133
part, which is at least a hundred feet above the level of the sea, we often found the same coral rock which is found at the shore, projecting above the surface in the paths; and in many places where there were large breaches with a small quantity of stinking water at the bottom, it was always in the solid coral shatterd or seperated as it were by violence.

At one place we fell in with a house where they were manufactur- 281
ing their cloth, which though extensive in itself is a very simple
operation. They take the slender stalks (or trunks) of the papper [248]
mulberry plant, which they cultivate for that purpose and seldom
grows more than six or seven feet in height or four fingers in thick- [237]
ness, from which they strip the bark and scrape off the outer rind with

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[1] Maile, *Alyxia stellata*, a shrub with fragrant long slender stems, abundant small leaves and dark red berries, much used for wreaths. [824]

[2] Hoi, *Dioscorea bulbifera*, one of the yams, with small flowers in spike-like clusters.

[3] *vao*, land in its natural uncultivated state. Anderson is very accurate.

[1777]

249 branches considerably with large heart shap'd leaves and jointed
stalks. The root is the only part us'd, which being dug up is given to
216 the servants that attend, who breaking it in pieces scrape the dirt off
with a shell or bit of stick, and each begins & chews his portion which
[415] they spit into a bit of plantane leaf: and the person who is to prepare
[412] it collects all these mouthfulls and puts them into a large wooden dish
or bowl with three or four feet, & adds as much water as will make it
of a proper strength. It is then well mixd up with the hands, and some
loose stuff which mats are made of thrown on the surface, which
being turn'd in intercepts the fibrous part and is wrung hard to get
as much as possible out from it, when it is given to some of the bye
sitters who sometimes prepare a weaker sort from it for themselves by
276 chewing it again. They then begin to distribute it in little cups made
574 of a bit of plantane leaf tied at each end, but where the company is
large & respectable as our present one was the person who distributes
[415] it calls out to know who the servants shall carry it to, and is commonly
directed by one person belonging to the chief who gives the Kava.
Each person has a clean cup which they throw away as soon as it is
drank, and the quantity is commonly about a quarter of a pint,
though they sometimes venture on two cups if much has been made.
276 The immediate effect it produces is not perceptible on these people
who use it so frequently, but on some of ours who try'd it, though so
nastily prepar'd, it had the same power as spirits in making them
drunk, or rather producing that kind of stupefaction in consequence
of using Opium or other substances of that kind. It should be observ'd
at the same time that though they have it always fresh prepar'd—
and I have seen them drink it seven times before noon—it is nevertheless
so disagreeable or at least seems so that the greatest part of
them cannot swallow it without making wry faces and shuddering
afterwards.

114 After this we set out from Mooa and meeting several Canoes in our
way Poulaho calld to them and took what fish he pleas'd. We din'd
[643] on a small island call'd 'Onne'vy[1] about a league off the mouth of the
[312] bay, where Poulaho said there was good water but we found as was
said before that these people have very little knowledge of such a
[103] valuable article for there was none of it tolerable to us. This island is
311 quite in a natural state, being only frequented as a fishing place, and
has nearly the same productions as Palmerstons island with some
226 E'toá trees.

114 On returning to the ship we pass'd a curious large rock which
133 seems to have been thrown upon the reef where it stands by accident.

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[1] 'Onevai.

764 remarkable except a Fyatocka of one house standing on an artificial mount at least thirty feet high. A little on one side there is a pretty 644 large open Area and not far from it a good deal of uncultivated ground, which upon enquiring why it lay waste they seem'd to say 311 belong'd to that place which was Poulahos, and not by any means to be touch'd. There was also at no great distance a number of E'toa 196 Trees on which clung millions of the large Ternate Bats[1] making a disagreeable noise. We could not kill any at this time for want of muskets, but some that were got at Anna'mooka measur'd near three feet when the wings were extended.

On returning our host orderd the hog that had been dress'd to be 648 brought, with several baskets of bak'd yams and some Cocoa nuts, 574 but we found that instead of his entertaining us we were to entertain 264 him, the property of the feast being entirely transferr'd to us his guests who were to dispose of it as we pleas'd. The person who cleand [262] it in the morning cut it up (but not before we desird him) in a very dexterous manner with a knife of split Bamboo, dividing the several parts with such quickness and hit the joints so exactly that surpriz'd us very much. The whole was set down before us, though at least fifty pound weight, untill we took a small piece away and desir'd they would share the rest amongst the people sitting round, but it was not without a great many scruples they did that at last, and then ask'd what particular people they should give it to. They were however very well pleas'd when they found it not contrary to any custom of ours, some carrying off the portion that was given them and others eating it on the spot, but it was with great difficulty we could prevail on Futtafaihe himself to eat a small bit.

After dinner we went with Futtafaihe and five or six people who 765 attended him to the same place where Poulaho had carried us in the [114] morning the last time we were at Mooa, but not into the inclosure. They hung some leaves about their neck in walking to it as he had [824] done, and when we came to a large open boat house where a few people were they threw away their leaves, sat down before it and [304] gave their cheeks a few gentle strokes with the fist, after which they sat for about ten minutes with a very grave appearance & went away [292] without having spoke a single word. Every person who went to this house of mourning had a mat tied over the cloth they wore which was also the case the day Poulaho went. This explaind what Poulaho had mentiond about Tooge, though from the beating only lasting a few seconds he had not been observ'd to do it; and this seems only a

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[1] *Pteropus tonganus*; Cf. Bayly, II, p. 263, n. 3. This was evidently the bat that the Tongans called *ternatee*.

continuation of the mourning ceremony by way of condolance, for
upon enquiring who it was done for they said it was a chief who had 765
died at Va'vaoo some time ago, that they had practic'd it ever since
and would do it for a considerable time longer.

In the evening we had a pig dress'd as the hog with Yams and 648
Cocoa nuts brought for supper, and Futtafaihe finding we did not 574
like the scruples they had made before to accept of any part of the
entertainment, ask'd us immediately to share it & give it to whom we 264
pleas'd. When supper was over abundance of cloth was brought for 262
us to sleep in but we were a good deal disturb'd by an odd custom, at
least amongst the better people, of being beat while they are asleep. 519
Two women sat by Futtafaihe and perform'd this operation, which is
call'd Tooge Tooge,[1] by beating briskly on his body and legs with
both fists as if on a drum till he fell asleep, and continued it the
whole night with some short intervals. After being asleep they abate
a little in the strength & quickness of the beating, but resume it if
the person is likely to wake, and towards the morning we found the
women relievd each other by turns & went to sleep. In any other
country it would be suppos'd such a practice would put an end to all
rest, but here it certainly acts as an opiate and is a strong proof of
what habit may effect. The noise made by this was however not the 521
only thing that prevented our resting, for the people who slept in the
house not only convers'd amongst each other frequently as in the 264
day but all got up in the midst of the night & made a proper meal of 262
fish and yams, which were brought to them by a person who seem'd
to know very well the appointed time for such things.

[JULY 1777]

TUESDAY JULY 1st. The wind N and NNW. Gentle breezes with fine 132
weather. In the morning we set out with Futtafaihe and walk'd down
the east side of the Bay to the point that is opposite Hoolaiva. The 114
country all along this place is very well cultivated but in general not 648
so much inclosd as at the bottom, and amongst many others that are
very large we pass'd one plantane field at least a mile long which was 311
in excellent order, every tree growing with great vigour and not a 245
bit of grass to be seen. We found that in travelling Futtafaihe
excercis'd a power, though by no means wantonly, which pointed 643
out the great authority of some of the principal men, or is perhaps
only annex'd to the royal family; for he sent to one place for fish, to
another for yams &c and so on at other places, which were always
brought with the greatest readiness as if he had been absolute master

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[1] *tukituki.*

assume a rocky appearance towards the NE point though not above 133
seven or eight feet high, and neither of these places have any shelter for ships, at least the S side which is bold on every part and has a high surf breaking on it. At the W or rather NW end is an open road,[1] where [487]
Tasman anchor'd in 1643 and Capt^{n} Cook in 1773, but besides being unsheltered the ground is very foul, and Maria bay near the W end [134]
on the N side is far from being a good harbour for large ships from its shoals & difficult entrance. The place where we lay is exactly in S Latitude, E Longitude, and forms a harbour every way safe and convenient with a good landing place, except just at low water when a sandy flat that runs off a little way prevents the Boats getting quite close. It is near the middle on the [439]
north side of the island, and though in the neighbourhood of perhaps the least inhabited part of it, is not less convenient as the natives will [609]
always bring supplies, and there is less danger of being pester'd by their numbers. A ship coming here ought to make the NE part of the island, and run down between the main and little isles lying off it till she has pass'd the narrow between Makka'ha and Mon'ooafai, which we went out by, and then haul up for the Harbour within Pangiamotoo supposing the wind SE^{t}erly which is commonly the case. As the passage we came in by to the N^{o}ward is neither safe nor easy the best method is to wait for a breeze from the W^{t}ward or N^{o}ward, which frequently blows, to repass the strait of Mon'ooafai, or if time will not permit to work through with a flood tide as we did, the length of the whole passage between the isles and main not exceeding four leagues.

It is what may with the greatest propriety be calld a low island, as the trees on the west part when we lay at anchor only appear'd, and the only eminent part which can be seen from a ship is the SE point, though many gently rising and declining grounds are observable when on shore. The general appearance of the country does not [311]
afford that beautifull kind of Landscape often produc'd from a variety of hills and valleys, lawns, rivulets and cascades but at the same time it conveys to the spectator an idea of the most exuberant fertility, whether we respect the places improv'd by art or those still in a natural state, both which yield all its vegetable productions with the greatest vigour and perpetual verdure. At a distance the 137
surface seems entirely cloath'd with trees of various sizes, some of which are very large, but above the rest the tall Cocoa palms always raise their tufted heads and are far from being the smallest ornament

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[1] Van Diemen's Road.

suffer'd to shoot into a trunk, and the coarser sort which they sleep 462
upon from a plant call'd E'varra.[1] There are many other articles of
less note that employ their spare time, as combs of which they make 285
vast numbers, little baskets made of the same substance as the matts [824]
and others of the fibrous Cocoa nut husk, either plain or interwoven [245]
with small beads, but all made with such neatness and taste in the [248]
disposition of the different varietys, which are very numerous, that a
stranger cannot help looking with pleasure at their assiduity and
dexterity. Every person knows the beautifull character that Solomon 462
has drawn of an industrious women and the happy consequences
that attend it, and we may almost venture to say that Solomon in
that character has included a true picture of all the women of Tonga.
The province alloted to the men is as might be expected far more
laborious and extensive than that of the women. Agriculture, Archi- [241]
tecture, Boat building, Fishing and other things that relate to Naviga- [341]
tion are the objects of their care. I would not wish to refer to any [396]
thing prior to the date of this voyage to illustrate any circumstance [226]
by, when I can avoid it, as it would be interweaving subjects that [502]
ought to be seperate unless every person knew them as well as myself,
but I cannot help relating here an observation which may have been
made before, though not to my knowledge, which is that in all the 562
places I have visited in these seas the degree of civilization that has 171
taken place amongst them may be known by the attention they pay
to the fair sex. Those in a very barbarous state treat their women
with such a degree of rudeness or rather brutality and at the same
time indifference that they seem to think them not so much intended
as a companion, or to be upon the same scale with themselves, as a
set of beings every way inferior to them and only fit for such mean
offices as they would not stoop to. On the contrary as civilization has
advanc'd we find them not only eas'd of those laborious employ-
ments which their natural delicacy of frame requires, but treated
with that respect to which they are often more justly entitled than
their lordly masters, and have even a great sway in the management
of affairs. Cultivated roots and fruits being their principal support 241
requires their constant attention to Agriculture, which they pursue
very diligently and seem to have brought to as much perfection
almost as circumstances will admitt of. The land about Mooa though 241
so well planted is scarcely equal to that part of the island where Cap^t^
Cook anchor'd in 1773, and from Mooa to the NE point which is all 311
the places we have seen it is tolerable, from whence one might sup-
pose, if the unseen parts are in the same proportion, that two thirds

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[1] *fala* was the word for sleeping-mat, not for a plant. The pandanus was called *fa*.

241 of the island is in the highest state of cultivation. The large extent of [311] the Plantane fields was taken notice of already, and the same may be said of the Yams, these two together being at least as ten to one to all [412] the other articles. In planting both these it does not appear they turn over the ground as we do, but in a field that has lain waste and is coverd with grass they dig small holes for their reception, and afterwards root up the grass with a flat narrow wooden instrument call'd Hōōò,[1] which in this hot country is quickly depriv'd of its vegetating power and soon rotting becomes a good manure. They are planted in rows by a line such as our Gardiners use, in such a manner that which ever way you look the rows present themselves regular and compleat. The Plantanes are usually three paces asunder, the Yams two and the Jeejees one. The first are shoots from the root of the old tree, which when weak they often defend with a sort of basketing laid over them, and the Yam tendrils at first shooting up are frequently 245 supported on short bits of sticks. The Cocoa nuts and bread fruit trees 241 are scatterd about without any order and seem to give them no trouble after they have attaind a certain heighth. The same may be said of another large tree which produces great numbers of a large roundish compress'd nut call'd 'Eēēfee,[2] and a smaller tree that bears a rounded oval nut two inches long with two or three triangular kernels, tough and insipid, call'd Mabba,[3] most frequently planted near their houses. The Kappe is commonly regular[l]y planted and in pretty large spots, but the Ma'whaha is interspers'd amongst other things, as the Jeejee or Yams, the last of which I have frequently seen in the interspaces of the Plantane trees at their common distance. 241 Sugar cane is commonly in small spots crowded closely together, and 248 the Mulberry of which the cloth is made, though without order, has [249] sufficient room allowd it and is kept very clean. The only other plant they cultivate for their manufactures is the Pandanus which is commonly planted in a row close together at the sides of the other fields, and they consider it is a thing so distinct in this state that they have a different name for it,[4] a proof that they are very sensible of the great changes brought about by cultivation. Whether the same remark may be applied to the Mulberry I am not certain, for it seems doutfull if ever they knew it in any other than its present cultivated one, as it never flowers; at least there was none of the old trees from whence they could propagate it seen, wheras the Pandanus is one of 417 the most common in the country. Their fences should be considerd

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[1] *huo.*

[2] Ifi, *Inocarpus edulis.*

[3] Mapa, *Diospyros lateriflora* or *D. ellipticifolia.*

[4] The Tongan vocabulary at the end of the third volume of the printed *Voyage* gives one of the meanings of 'Keeai' [*kie*] as 'the cultivated Pandanus'.

nothing but the trees that cover them, but here the land rising gently 133
upwards presents us with an extensive prospect, where groves of trees
are only interspers'd at irregular distances in beautifull disorder and 137
the rest coverd with grass. Near the shore again it is quite cover'd
with various trees amongst which are the habitations of the natives, [361]
and to the right of our station was one of the most extensive groves of
Cocoa palms I ever saw.

SUNDAY 13th. The wind E. Fresh breezes with cloudy Wr & in the 132
evening a little rain. Brought off a Launch load of water. Traded on
shore for a good number of Yams and some hogs. 114

In the afternoon a party of us made an excursion to the highest 439
part of the island, which was a little to the right, and in our way
pass'd a deep valley or rather chasm which is very narrow. About 133
half way up we could see that part of the island under us extended [311]
into a large down which had several risings interspersd with small
clusters of trees, but quite uncultivated, and coverd with grass about
the height of the knee where numberless cattle might be fed. On the [349]
top we found a round heap of coral stones which they call'd E'tchee
as that at Tonga, and seem'd to say it was a mark of Poulahos
sovereignty over the island. At this place was also a spring of excellent [312]
water, and though we found Coral rock at the surface, on crossing the
deep valley which is several hundred feet above the sea we saw here
a soft reddish rock and some sand stone. The top of the island from
this to the north point is an extended flat like that before mentioned,
behind which it rises gradually; but the east side of the island, though
it has a flat like the opposite one, terminates in steep craggs towards
the sea and is at this place in all not above five or six miles broad.
Besides the plants common on the other isles we found on the height 137
a species of Acrosticum,[1] Melastoma[2] and Fern tree[3] with a few other
ferns and plants not common below. Amongst the rest was the Jeejee
in its natural state which grows eight or ten feet high. We return'd by 487
another road which led us through a wooded part of the country and
about third way down met with a little pool of excellent water which 312
kept running into a much larger below, but we could not follow it as
the valley was rugged and the natives say it does not reach the sea
unless when it rains much. We found they burnt the grass in many 311
places but could not discover that it was intended for planting,
although they have a few spots cultivated almost to the top.

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[1] Probably this was the fern Hakato, *Acrostichum aureum*.

[2] *Melastoma denticulatum*, a branched spreading shrub called in Tonga Peaikuku.

[3] The fern tree Longolongo, *Cycas circinalis*, found all over Tonga, and especially common on 'Eua.

[1777]

684 On returning we were informd that a party of indians had got into the ring where our people traded, struck one of their own people with a club which lay'd bare or as others said fracturd his scull & then broke his Thigh with the same, when our men interposd and sav'd him from being killd. He had no signs of life when carried to a neighbouring house but afterwards recoverd a little, and on asking the reason of so severe a treatment we were informd that he had been discoverd in a situation rather indelicate with a woman who was Taboo'd. We however understood that she was no otherwise Taboo'd than by belonging to another person & rather superior in life to her Amoroso, so that he had not transgress'd in any mysterious point as that word seems sometimes to imply. From this circumstance we had an oppurtunity of observing how they punish infidelity, but the female sinner has by far the slightest share for her misdemeanor as they told us she would only be slightly beat, & indeed the man in such cases perhaps seldom suffers death: as though this person seemd to us to have been very roughly handled they appeard to have no suspicion of his dying from it & said he would be well in a month, so that in all probability if the transgressor in these cases can keep out of the way till the passion of the offended party has subsided, he may escape with a very slight punishment.

132 MONDAY 14th. The wind ENE or NE. Fresh breezes with dark weather
and in the afternoon a constant heavy rain and sultry air. Our
439 people continued to trade on shore for a good quantity of Yams,
Hogs and Fowls & some were employed to cut grass for the Cattle.

Some of us went several miles into the valley which runs between
114 the upper and lower rising of the island to the S^{o}ward. We found the
country tolerably cultivated, the soil on the high grounds being
311 chiefly a red clayey substance but below black and loose, and on
134 examination it appeard that every spot of the grassy part would
admitt of cultivation with the greatest ease & in all likelyhood yield
every thing in the same abundance as those already planted.

132 TUESDAY 15th. The wind N and NNW. Fresh breezes with dull
weather in the morning and then constant heavy rain till near the
evening. A considerable swell set in upon the shore but the ships rode
439 easy. Continued to barter for yams & other things as yesterday.

132 WEDNESDAY 16. The morning calm and the rest of the day variable
breezes or calm. A large swell setting in which broke very violently
133 on the shore, so that it was with great difficulty our boats got off at
night, and it would seem that it is sometimes impossible to get out at

nearly like that of Otaheite & they blow into it through the Nose, but 534
make very indifferent Music of it. The Mimia is made like the Pipe
of Pan with nine fistulæ tyed together of different Lengths, they draw
them along the Mouth & blow into them, but I never found that
they made any thing like music out of them. The Drums are made of
large cylindrical Pieces of wood like a Garden roller & excavated,
which must cost them much trouble to do with their Tools; a Slit
just wide enough to get the Hand in is made from one end to the
other & there is no hole at either end, they beat them with 2 Sticks.
Other musical Instrum^{ts} if such they may be called have been already
mentioned in the account of the Dances at Happai.

Their carving they execute very neat, this art is chiefly employed 532
by them in ornamenting their Clubs, which they carve all over with
the shape of Men, Birds, Dogs & Fish &c. in different parts, and fill
up the whole with strait & spiral Lines in various directions & they
sometimes inlay them with bone, as they likewise do their Stools that
they use for pillows tho' they never carve them, they also carve the
handles of fly flaps in the same Manner that they do their Clubs, &
they have small sticks carved two of which they put between their
fingers & clap together in the same manner that Children in England
do with Stones. They have small Images of Men & Birds made of [301]
Bone which they sometime[s] wear about their necks as ornaments.
They polish their different Manufactures of wood with a file which [321]
is made of a piece of wood covered with the Skin of the Shark. [412]

The general appearance of the Island is very beautiful it being [237]
entirely covered from one end to the other with Cocoa nut, Breadfruit
& other fruit trees, it is low, there being not a single Hill or any con- 133
siderable rising Ground upon it; it is long & narrow being about 137
in Length & broad. On advancing into the
interior part of the Country nothing can be more pleasing than the 344
appearance of their Houses and Plantations & of the Cocoa nut, [311]
breadfruit and Plantain Trees loaded with fruit & the large fields of [241]
Yams which are to be met with all over the Island, over which you
travel along delightful Lanes between the Wicker Partition of the [764]
different inclosures, & here & there is a burying place and a large
building much larger than the dwelling Houses, which seems ap-
propriated as a public Hall for the use of a district to meet in to
transact public Business or to perform their Dances, or as they were
situated near the burying places they perhaps perform some Cere-
monies in them at their Funerals. There were generally two or three
Seats hewn in the Pillars that supported the Building which seemed
to be for the reception of the Priests or Chiefs; in these Houses they

58: King G,T-5 (1777) 1967 OU9 Tonga OU9

the time that their entertainments were exhibit'd there might be not short 175
of 12,000 people, who built temporary huts or slept under the trees about 161
the tent; at the Ceremony at Moa[1] we suppose not less than 600 chiefs 162
were assembled, but from these bodies I see no good conclusion to be 609
drawn of the number in either all, or any one of them. From the Nature of
the Country, requiring the labour & industry of the Natives for their 361
support, it cannot be near so populous in proportion to their size as what 311
the Society Islands are; the houses here are by no means thickly scatterd 134
about & many parts in all the Islands are uncultivat'd, owing to the 133
Sandiness & poverty of the Soil in low Islands, & in the high ones to their
elevatd & expos'd situation; besides the larger low Islands have extensive
lagoons & lakes as at Tonga & Anamooka, which considerably lessens the
surface, leaving therefore their population to be gatherd from the nature of
the Country. We will proceed to their Colour, form, & Natural dispositions.

The Friendly Islanders are of a lively brown Colour & a shade darker 142
than Omai. Although many of their principal women were fairer, their
colour resembles that of the Mallays we saw at the Cape of Good hope;
they are in general above the middle size, many very tall men & but a few
under sizd, they are firmly & compactly made about the joints, broad
shoulderd & Muscular, & perhaps few natives exceed them in that form,
which requires both strenght & agility; this is even to be observ'd in their
walking but abundantly shewn in their athletick exercises & dances: their 302
hair I believe is universally black or a dark brown when young, but they
have a method of colouring it which deceives one at first; it is not unusual 765
to see two diff^t colours on the same head, & perhaps one purple; a sort of 175
chalky paste which they very often daub upon their heads turns the hair a
yellow sandy colour; they are still more various in their fashion of wearing
it, being cut short on some parts & others left long, yet as they seem to
admire fine long hair, we rather suppose that when it is even partially cut,
& we know it to be the case when all short, that it is in memory of some
deceas'd friend. There are but few who have beards, but shave very 142
dextrously with 2 shells, laying one under the hair & the sharp point of the 302
one above meeting that of the one below, cuts it close off. The Chiefs have 175
glossy smooth skins preservd so by frequent washing; & as fresh water is 565
scarce, they after bathing in salt water throw over them a few coco nut 515
shells of fresh, which takes the salt which otherwise adheres to the skin, & 312
which gives a disagreeable roughness to that of the common people, &
afterwards rub over their bodies Coco nut Oile perfectly sweet & free from
any disagreeable smell. There are nevertheless many cutanious marks 175
from disorders & from voluntary inflictions; more than half of them are 164
affect'd with the tetter or ringworm, which leaves behind a whitish mark; 765
boils & blotches are often met with, & inflam'd sore Eyes are frequent; few
are free from marks on the Cheek bone, which they make by quick repeating
strokes with the knuckles on the death of their friends or relations,
besides these there are many other disfiguring marks inflict'd on the same

[1] Mu'a.

166 The pattern of internal migration, however, shows more sensitive
182 response to population pressure, particularly in Ha'apai. The basic
reason for migration in Tonga is the lack of opportunities to earn
166 money in the outer islands as compared with Tongatapu, but the
182 influence of land shortage is indicated by the fact that, within
161 Ha'apai, population growth between 1956 and 1966 in each island
162 tended to be inversely proportional to the 1956 population density
[311] (Fig. 7.2). The three islands which lie furthest from the general trend
(circled in Fig. 7.2) all have residents who utilize land on the nearby
high island of Tofua, and their effective population densities are
182 therefore lower than those shown. It may be hypothesized that the
higher the population density the harder it is for men, particularly
511 those without their own allotments, to achieve a satisfactory cash-
246 crop income, and in Ha'apai this problem is made greater by the
464 fact that until recently cash cropping was largely restricted to
coconuts, while opportunities for wage employment in the group
166 have always been very limited. Of 20 cases of migration collected in
Holopeka (Ha'apai), for instance, 18 were men without allotments,
182 and 11 of these had left their village at least partly in the hope of
obtaining land. That landlessness is not the only reason for migration,
however, is shown in the fact noted earlier that those who had
left Ha'afeva (Ha'apai) in 1966 included nearly half the men who
[731] already held land on the island. Employment following education
on the main island, dissatisfaction with village life, a desire to take
advantage of the better opportunities to earn money in Tongatapu
or to ensure a better education for one's children are all important
reasons for movement, while in Vava'u the damage caused to the
economy by the 1961 hurricane seems to have been the major
determinant of migration from that group in the early 1960s.
Nevertheless, the pattern of migration from Ha'apai outlined earlier
does demonstrate the significance of land shortage as a factor, and
suggests that population pressure is sufficiently felt by many Tongans
to stimulate them to leave their home village.

CONCLUSION

121 In the preceding sections we have examined a number of facets of
182 the man/land system in Tonga. Symptoms of stress or pressure were
found in land problems, the fallow vegetation, the nutrient status of
the soil, cash-crop incomes and internal migration, and these point

[427 cont.]

114 He [428] will [A]admire an elegant flowing robe which involves the whole
291 head and body, in an island where the women very rarely cover
302 the shoulders and breast; and he will be struck with awe and delight
by the figure of a divine old man, with a long white beard, though
all the people of Ea-oowhe shave themselves with muscle-shells.

175 We soon left the landing place, and followed the chief, who
123 invited us up into the country. The ground from the water's side
175 rose somewhat steep for a few yards, above which it flattened into
311 a beautiful green lawn, surrounded by tall trees and tufted
175 shrubberies, and open only to the sea. At the bottom of it, which
342 might be about one hundred yards from the landing-place, we saw a
very neat well-looking house, of which the roof sloped down within
[123] two feet of the ground. We advanced across the delightful green,
which was so smooth, that it put us in mind of the finest spots in
England, and were entreated to sit down in the house, which was most
elegantly laid out with mats of the best workmanship. In one corner
of it we saw a moveable partition of wicker-work standing upright,
and, from the signs of the natives collected, that it separated their
[824] bed-place. The roof, sloping down on all sides, was formed of
a great number of spars and round sticks very firmly connected, and
covered with a sort of matting made of banana leaves.

175 [429] We were no sooner seated in the house, surrounded by a
533 considerable number of natives, not less than a hundred, than two
[609]
[123] or three of the women welcomed us with a song, which, though exceed-
[171] ingly simple, had a very pleasing effect, and was highly musical
when compared to the Taheitian songs. They beat time to it by
snapping the second finger and thumb, and holding the three remaining

[A] [Forster is critiquing an illustration in Cook's published account—Analyst.]

[440 cont.]

175 by it in the most shocking manner; there was only a hole left in the
164 place of her nose; her cheeks were swelled up and continually
oozing out a purulent matter; and her eyes seemed ready to fall out
[439] of her head, being bloody and sore. These were some of the most
miserable objects I recollect ever to have seen; and yet they seemed
to be quite unconcerned about their misfortunes, traded as briskly
as any of the rest, and what was most nauseous, had provisions to
sell.

175 After dinner Dr. Sparrman remained on board with me, in order
122 to arrange our acquisitions of the morning, and my father again
[126] accompanied the captains to the shore, with a view to collect a fresh
supply. They returned about sunset, and my father gave the following
account of this excursion.

175 "At the landing-place the natives welcomed us with shouts as in
439 the morning, and the croud being as numerous as ever, the trade was
carried on very briskly, but provisions were scarce, and shaddocks in
particular not at all to be had, as the season was not yet sufficiently
175 advanced. Mr. Hodges, myself, and one servant, left the trading-place with
123 [441]two of the natives, whom we engaged to become our guides in
case of necessity, and walked up the hill to view the interior part
175 of the country. Our walk lay through a number of rich plantations or
311 gardens, enclosed as before mentioned with fences of reeds, or with
417
137 quick-hedges of the beautiful coral flower, (erythrina corallodendron.)
175 Beyond these we entered into a lane between two enclosures, and
311 observed bananas and yams planted in rows on both sides, with as much
487
[244] order and regularity as we employ in our agriculture. This lane
[245] opened into a fine extensive plain, covered with rich grasses. Having

[441 cont.]

175 crossed it, we met with a most delightful walk about a mile in
311 487 length, formed of four rows of coco-nut trees, which ended in
another lane between plantations of great regularity surrounded
by shaddocks and other trees. It led through a cultivated valley
to a spot where several paths crossed each other or met in one.
175 Here we saw a fine lawn covered with a delicate green turf, and
351 surrounded by large shady trees on all sides. In one corner of it
there was a house, which was empty at present, its inhabitants being
175 probably by the water's side. Mr. Hodges sat down to draw this
126 delightful spot. We breathed the most delicious air in the world,
175 fraught with odours which might have revived a dying man; the sea
[136] breeze played with our hair and gently cooled us; a number of small
birds twittered on all sides, and many amorous doves cooed harmoniously in the deepest shade of [442] the tree under which we were
[137] seated. The tree was remarkable for its roots, which came out of
the stem near eight feet above the ground, and for its pods of more
than a yard long, and two or three inches broad. This secluded
spot, so rich in the best productions of nature, where we sat
solitary with no other human being besides our two natives, struck
us with the idea of enchanted ground, which being the creation of
our own gay fancy, is commonly adorned with all possible beauties
at once. In fact, there could not have been a more desirable spot
for a little place of retirement, according to the elegant imagination
of Horace, if it had only been supplied with a crystal fountain or
[312] a little murmuring rill! But water is unfortunately the only blessing
[764] denied this charming little island. To the left of this spot we
[487] discovered a shady walk, that brought us to another grassy lawn, at

[442 cont.]

175 the bottom of which we perceived a little mount with two huts
764 [487] upon it. A number of reeds stuck into the ground, at the distance
[417] of one foot asunder, encompassed this rising, and several
[137] casuarinas, with their slender branches and thread-like leaves,
were planted before it. The natives, whom we had engaged to
accompany us, would not approach this mount; but we advanced and
looked into the huts, though with great difficulty, because the
bottom of the roof was not above a span from the ground. We found
a corse in one of these huts, which had been lately deposited; but
175 the other was [443] empty. Thus the casuarina or club-wood (tòa),
764 here, as in the Society Islands, pointed out the repositories of the
137 171 dead. Its dull brownish-green colour, and its long spreading branches,
where the leaves are thinly scattered and hang weeping down,
certainly become these melancholy places to the full as well as the
175 funereal cypress. It is therefore probable that the same train of
764 ideas, which consecrated the latter in one part of the world to shade
181 the tombs, might fix upon the former in these regions for a similar
175 purpose. The mount on which the huts were placed was formed of
764 small pieces of coral rock, like gravel, accumulated without any
175 particular order. From thence we proceeded a little farther, and
311 still found the same elegant plantations and the same kind of houses
361 in the middle as before. Our natives conducted us through one of
175 609 them, where they entreated us to sit down, and procured some coco
175 nuts, which proved extremely refreshing. At our return we found
123 our boats just ready to put off, and embarked with them immediately.
[609] We had only seen a few of the natives on our walk, who passed unconcernedly by us towards the place where the captains traded; and

[445]

175 As soon as the captains had delivered their present, they
[565] returned to the ships, and the chief came on board with us. Our anchor was weighed, our sails were spread to the wind, and we forsook this happy island when we had scarce discovered its beauties.
[439] The chief, after selling a number of fish-hooks for nails and beads,
[565] hailed one of the canoes which were passing by, and left us with looks
[609] which spoke his friendly, open disposition.

[101] We now sailed along the western shore of Tasman's Amsterdam
[133] island, which the natives called Tonga-Tabboo, and found it a very
[131] low flat land, compared with that which we had left. The middle of this island is nearly in 21° 11′ S. latitude, and 175° W. longitude.
[133] Its highest elevation above the level of the sea, appeared to the
[311] eye never to exceed six or seven yards perpendicular. On the
[184] other hand, its extent was much more considerable than that of Eaoowhe, and by the help of our spying-glasses, we discovered the same regular plantations which we had so much admired there, and saw the shores crouded with inhabitants, who gazed at us, probably with as much attention as we bestowed upon them. When we were about half way between both islands, or nearly three leagues from each, we were met by several canoes full of men, who attempted to come along-side, but as we happened to be too far to windward, they could only fetch the Adventure, where they came on board.

175 [446] In the afternoon we approached the northernmost end of
133 the island, and perceived some small isles connected by reefs to the eastward. Their situation and that of the shoal to the north-west, where the sea broke with great violence, convinced us that we were now arrived at the very place where Tasman anchored in 1643,

[447 cont.]

000
175 out of the boat. A party of the marines were posted on the beach
648 in case of danger; to protect the captain's clerk, who traded for
[439] provisions. The natives did not express either surprize or dislike
at this proceeding, perhaps because they were unacquainted with its
175 meaning. They received us with acclamations of joy as at Ea-oowhe,
609 and desired us to sit down with them on the rocks along shore, which
133
175 consisted of coral, and were covered with shell sand. We purchased
439 several beautiful parroquets, pigeons, and doves, which they brought
231 to us perfectly tame; and our young Borabora-man Mahine (or Hedeedee)
237 traded with great eagerness for ornaments made of bright red
feathers, which he assured us had an extraordinary value at Taheitee
175 and the Society Islands. Here they were commonly pasted to aprons
292 used in their dances, and made of the fibres of [448] coco-nut,
237
824 or fixed upon banana leaves, forming rhomboidal frontlets or diadems, &c.
000 With a degree of extasy which gave the greatest weight to his assertion,
he shewed us that a little piece of feathered-work, as broad as two
or three fingers, would purchase the largest hog in his island..
114 Both this youth and O-Mai were much pleased with the inhabitants of
175 these islands, and began to understand their language tolerably well.

175 We left the beach after the first acquaintance with the natives,
311 and ascended a few feet into a wild forest consisting of tall trees,
[137] intermixed with shrubberies. This wood though narrow, being in
many places not above one hundred yards wide, was continued along
the shore of Van Diemen's road, being more or less open in various
parts. Beyond it the whole island was perfectly level. We walked
across a piece of uncultivated land, about five hundred yards wide,
which adjoined to the wood. Part of it appeared to have been planted

175 [448 cont.]
Part of it appeared to have been planted
311 with yams, but the rest was full of grass, and had a little swamp
[244] [133] in the middle, where the purple water-hen, of poule sultane,
[136] resided in great numbers. As soon as we left this, we entered into
[487] a lane about six feet wide, between two fences of reed, which
[417] enclosed extensive plantations on each side. Here we met many of
[609] [201] the natives, who were traveling to the beach with loads of
provisions, and courteously bowed their heads as they passed by us
in sign of friendship, generally pronouncing some monosyllable or
175 [449] other, which seemed to correspond to the Taheitian tayo. The
351 enclosures, plantations, and houses were exactly in the same style
184 as at Ea-oowhe, and the people had never failed to plant odoriferous
175 shrubs round their dwellings. The mulberry, of which the bark is
137 manufactured into cloth, and the bread-tree, were more scarce than
at the Society Isles, and the apple of those islands was entirely
unknown, but the shaddock well supplied its place. The season of
spring, which revived the face of all nature, adorning every plant
with blossoms, and inspiring with joyful songs the feathered
tribe, doubtless contributed in a great measure to make every object
175 pleasing in our eyes. But the industry and elegance of the natives,
311 which they displayed in planting every piece of ground to the greatest
181 advantage, as well as in the neatness and regularity of all their
works, demanded our admiration, whilst it gave us room to suppose,
that they enjoyed a considerable degree of happiness.

175 One of the lanes between the enclosures led us to a little grove,
137 which we admired for its irregularity. An immense casuarina tree
[136] far out-topped the rest, and its branches were loaded with a vast
number of blackish creatures, which we took for crows at a distance,

175 [473 cont.]

535 of coco-nut core, and ornamented with shell-work and red feathers,
124 [292] or such [474] as were curiously wrought of mats in resemblance of
[439] fretwork. From these gestures I have great reason to suppose that
[171] their dances are of a dramatic kind, and public, like those which
175 I have spoken of in the Society Isles, (See pag. 398). Schouten
171 and Le Maire likewise strongly confirm this supposition by their
[535] account of the dances at Horne Island (24). It appeared, upon
the whole, that the customs and language of these islanders have
a great affinity with those of the Taheitians, and that it would
not therefore be very singular to find a coincidence even in their
amusements. The greatest differences between these two tribes,
who must have originated from the same stock, seem to be owing to
the different nature of their islands. The Society Isles are well
furnished with wood, and the tops of their mountains are still
[311] covered with inexhaustible forests. At the Friendly Isles this
[137] article is much scarcer, the surface (at least of those which we
[342] have seen) being almost entirely laid out in plantations. The natural
consequence is, that the houses are lofty and of immense extent in
the first group of islands; but much smaller and less convenient in
[501] the last. In one the canoes are numerous, I may almost say innumerable,
and many of a vast size, and, in the other, very few in number, and
175 much smaller. The mountains of the Society Isles continually attract
171 the vapours from the atmosphere, and many rivulets descend [475]
312 from the broken rocks into the plain, where they wind their serpentine
course and glide smoothly to the sea. The inhabitants of those
islands take advantage of this gift of bountiful nature, and not

24. See Mr. Dalrymple's Collection of Voyages, vol. II. p. 47.

175 [476 cont.]
433 The labour of the natives is therefore greater than that of the Taheitians, and
311 171 accounts for the regularity of the plantations, and the accurate
423 division of property. It is likewise to this source we must ascribe
175 it, that they have always set a higher value on their provisions
435 than on their tools, dresses, ornaments, and weapons, though
many of these must have cost them infinite time and application.
They very justly conceive the articles of food to be their principal
175 riches, of which the loss is absolutely not to be remedied. If we
142 observed their bodies more slender and their muscles harder than
461 those of the Taheitians, this seems to be the consequence of a
175 greater and more constant exertion of strength. Thus, perhaps, they
461 become industrious by force of habit, and when agriculture does not
433 occupy them, they are actuated to employ their vacant hours in the
fabrick of that variety of tools and instruments on which they
175 bestow so much time, patience, labour, and ingenuity. This industrious
181 turn has also led them, in the cultivation of all their arts, to so
[171] much greater perfection than the [477] Taheitians. By degrees they
have hit upon new inventions, and introduced an active spirit and
175 enlivening chearfulness even into their amusements. Their happiness
181 of temper they preserve under a political constitution, which does
642 not appear to be very favourable to liberty; but we need not go so
far from home to wonder at such a phaenomenon, when one of the most
enslaved people in all Europe, are characterised as the merriest
[651] and most facetious of mankind. Still there may be more sincerity
in the chearfulness of the natives of Tonga-Tabboo; for, exclusive
of great and almost servile submission, their king does not seem
to exact any thing from them, which by depriving them of the means

Laportea harveyi, Rhus taitensis, Alphitonia zizyphoides, Dysoxylum spp., 137
and other trees may reach considerable size. Tongatapu and ‘Eua are the only [101]
permanently inhabited islands of the Tongatapu group.

The central, or Ha‘apai, group is about 90 miles from Tongatapu. It includes 131
the main islands of Lifuka, the former capital and site of the Chief's 101
Palace; Nomuka; Kao; Tofua; and a large number of smaller islands, many of which now support no permanent inhabitants.

Vava‘u, the largest and principal island of the Vava‘u group, has an area 133
of approximately 35 square miles and reaches an altitude of about 150 meters
along the precipitous northern coast. Its surface is uneven and the southern, [504]
very irregularly and deeply indented coastline provides a beautiful and completely [361]
land-locked harbor, where the principal town of Neiafu is situated. At the northwestern part of the island is a lake of brackish water and nearby is a rather large swamp of marshy area unique in the islands. Another, a large central lake connected at one point with the sea during high water, is found on the island of Nomuka in the Ha‘apai group. Large crater lakes also occur
on Tofua and on Niuafo‘ou. Ocean-going steamers are able to dock at Neiafu 504
in Vava‘u and at Nuku‘alofa on Tongatapu. Cutters and interisland boats can reach a jetty at the village of Pangai on Lifuka Island in the Ha‘apai group, and it is possible for very small boats to make a landing at a makeshift dock on ‘Eua. And it is usually possible, in moderate seas, to get ashore from
canoes or other small boats on the other low coral islands. It is much more 504
difficult, however, to land on the volcanic islands of Tofua, Kao, Late, Niuafo‘ou, 133
or Tafahi where most of the coast is steep and abrupt and where protecting reefs are lacking or do not break the often strong wave action. These islands can be reached only by canoe or small boat and under most favorable weather conditions, or by swimming from larger boats which must stand well off shore for safety.

The population of Tonga is nearly 50,000. It is heavily concentrated on 161
the islands of ‘Eua, Tongatapu, Nomuka, Lifuka, and Vava‘u and some of the 162
smaller adjacent islands. The volcanic islands of ‘Ata, Tofua, Kao, Late, and
Niuafo‘ou have few or no permanent inhabitants at the present time. The [731]
former population of about 1,300 on Niuafo‘ou was evacuated after the disastrous [166]
volcanic eruption in 1946, and at present makes up a large part of the population on ‘Eua. (See figure 2.)

The more heavily populated islands show a high percentage of land utilization, 137
the indigenous plant species surviving only in occasional uncultivatable [311]
areas, usually near the sea. Everywhere grows a number of species of greater or lesser usefulness presumably brought to the islands by the aborigines as they arrived in Tonga from other islands. These species predominantly show Asiatic, African, or Malaysian origin. A possible exception is the sweet potato, and there is considerable question as to how it reached Polynesia. In this group one may include that most useful of all plants for island peoples, the coconut.

Presumably, the unintentional introduction of certain weedy species occurred 137
at the same time. A good many cultivated species, together with many weeds,
owe their presence to the visits of European ships, starting early in the seventeenth
century and continuing with increasing frequency to the present time.
Some of these alien species find optimum conditions for growth and multiplication,
and have undoubtedly played a part in limiting or even exterminating
some endemics or indigenous species through aggressiveness. A high percentage
of the usual strand and weed species includes those frequently found
on other Pacific islands and elsewhere in tropical countries.

There is little fresh water available other than that impounded in tanks [312]
from rainfall. Aside from occasional small localized areas, the low coral islands
present a monotonous repetition of plantation weeds and fallow-resting plantations
of second-growth "bush." The dominant crop is coconuts, and large areas 245
have been cleared for the extensive plantations found on most of the islands.
At present, the high market value of copra makes it the most important source [434]
of income for the islanders. The second most important export crop is bananas, [439]
of which 50,000 or more cases are shipped annually to New Zealand. The more 311
rugged topography of 'Eua, and to a somewhat lesser extent of Vava'u, prevents
the cultivation of some parts of the islands. As a consequence, there [137]
are more opportunities on these islands for the survival of native species. Some 313
of the islands, especially 'Eua and Kao, still have significant timbered areas
with some of the tree species reaching a diameter of more than a meter and
offering a source of timber. Lumbering operations are being developed by the
government on 'Eua which, together with the fact that more and more of the
forested land is being cleared for new plantations, threaten to reduce or eliminate
many of the native species. Too, this has caused a soil erosion problem [311]
on some of the slopes. Lumbering operations on the volcanic islands of Late, [504]
Tofua, Kao, and Tafahi, because of the present lack of harbor facilities, are all
but impossible. It seems improbable, therefore, that much timber will be cut
on those islands in the immediate future, and it is on those islands that many
of the native species will have the best chance of survival. However, with any
marked increase in population, it will eventually become necessary to colonize
and develop such islands.

The climate of Tonga is pleasant during most of the year. The annual 132
temperature ranges from a low of around 75° F. in July and August to a high
of 85° to 90° F. from January to March. Slightly higher or lower temperatures
are not infrequent. The humidity is comparatively high, ranging from about
88° in the warmer months to a low of around 72° in the winter period. The
average mean rainfall is about 80 to 90 inches, with the wettest season during
the first six months of the year.

The collections upon which this report is based were made on the islands 101
of Tongatapu, 'Eua, Nomuka, Lifuka, Kao, Vava'u and Niuafo'ou between 126
February and June 1953. Projected visits to 'Ata, Tofua, and Late were aban-

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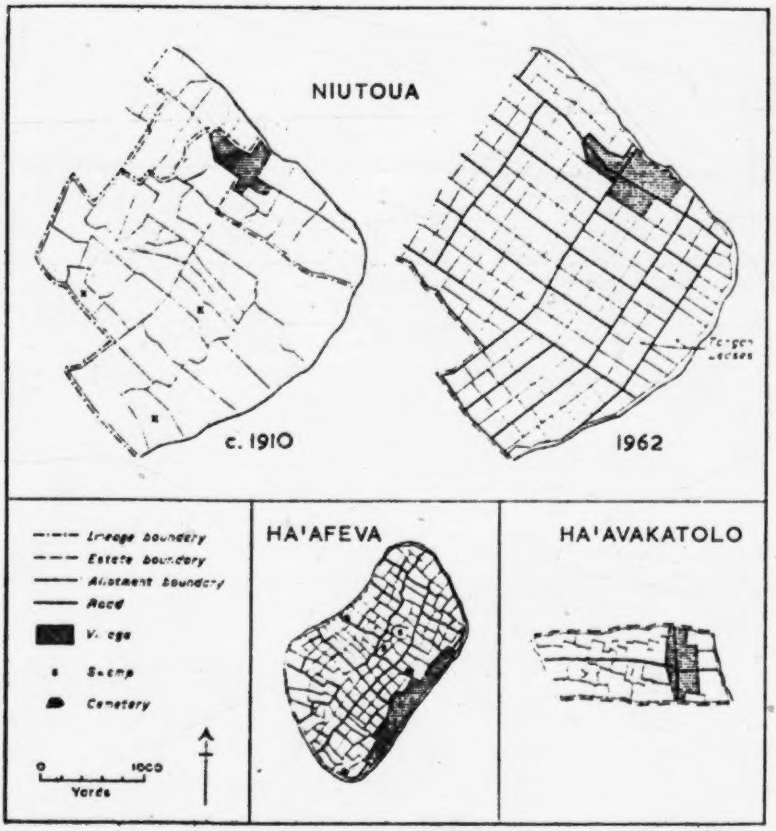
NIUTOUA
c. 1910
1962
Tongan Leases
Lineage boundary
Estate boundary
Allotment boundary
Road
Village
Swamp
Cemetery
0
1000
Yards
HA'AFEVA
HA'AVAKATOLO

Fig. 1 Land division in Tonga: some examples

him (see also Williamson 1924: vol. II:478-80 and vol. III:119-21). Ultimate title to the land was considered to be vested in the Tu'i Tonga, and the position of a chief seems to have been more that of a ruler of an area and its people than that of a landlord.

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565
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[631]
[643]

THE DEVELOPMENT OF THE PRESENT LAND TENURE SYSTEM

423
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[643]

While the exact nature of the traditional tenure system remains uncertain the development of the present system, particularly as it exists in law, can be traced more reliably. The first major change came in 1850 when George Tupou, finally established as the ruler of Tonga, claimed all the land by right of conquest,

allocated land left for leasing. Consequently land borrowing by 423
those who already have allotments of their own is common, and 425
land use by no means coincides with the tenure of land. Yet 182
borrowing is not always a satisfactory solution, for the borrower
can seldom obtain land except for a short period and for short-
term crops. While the more enterprising therefore tend to be [311] ●
hampered by the land tenure system, the lazy are protected, for
at present the government makes no attempt to enforce the pro-
visions in the Land Act requiring landholders to cultivate their
allotments and plant coconuts.

Land borrowing may also restrict the lender's control over the 425
use of his holding for, despite individual tenure, requests from 571
close relatives and friends for the temporary use of land are 602
difficult to refuse, and such requests are not necessarily made [423]
only to those who have land to spare. Social obligations of this
nature also restrict the independence of the farmer in other ways
familiar to the student of the South Pacific. For instance, rela- [241]
tives and friends may request a load of coconuts, a few baskets
of tubers, or cash, and consequently men trying to increase pro-
duction find their efforts hampered. Such obligations continue [178]
to be honoured partly because of tradition, sentiment and the
prestige gained by the giver, but also because they still fulfil [554]
their essential function of ensuring the security of the individual [182]
and his family. Marriages and funerals also involve obligations
of kinship and friendship. A study of the literature on Western 571
Samoa and Fiji, and the comments of Tongans who have lived
in Samoa and Samoans who have lived in Tonga, suggest that 602
the Tongan farmer may be able to achieve a slightly greater 423
degree of independence, without having to contract out of his 182
society, than is the case in the neighbouring territories, and for 241
this the system of landholding is probably largely responsible.
At the same time, however, individual tenure in Tonga has not [171]
produced fully independent farmers, for social obligations still
restrict the individual's control over his land, his time and his
produce.

SOME BENEFITS OF THE SYSTEM

Although various factors have thus restricted the effectiveness of 423
the Tongan land tenure system both as a method of land alloca-
tion and as a basis for land use, it has many good points. It has 182
provided many men with secure, lifetime, individual leaseholds
which can be passed on to their descendants; it has enabled
Tonga to avoid the problems of fragmentation, subdivision and

133 wide, constantly steaming, and surrounded by deposits of sulphur. The prevailing South-East Trade Winds carried the ejected material to the north-west of the island. Water entered the crater-lake from the ocean, as the eastern wall of the crater was very low; the water in the lake was thickly coated with sulphur and had a vile taste. Already in 1928 the waves were breaking down the soft cliffs, and the rain had made deep gullies down the slopes. It is the opinion of scientists that occasional sinkings of the ocean-floor in the Tonga Deep, which sometimes cause earthquakes in New Zealand, at other times cause lava to be pumped up through the opening in Falcon Island, and this accounts for the periodical re-appearance of this island of soft ash and scoria. Since 1928 smoke has been seen at various times, but the island is being washed down again.

133 (5) TOFUA is a large island, 1,700 feet high, over five miles long
131 and about four miles wide. Its area is 21 square miles, of which over
three square miles is the area of the lake in the crater of the active volcano,
which the Tongans call Lofia. Smoke can often be seen issuing
133 from the summit of this volcano, but there is no record of any destruction
caused in recent years. Formerly the island was inhabited, the village
175 being called Manaka. In 1789, when Bligh and his loyal sailors, who
had been cast adrift from the "Bounty" between Nomuka and Tofua,
648 landed at Tofua to get water, they were attacked by the natives who
killed the quartermaster, Norton. The island has been deserted since
166 1854, when Tubou I ordered the inhabitants to leave because of the risk
of eruptions. Tofua and Kao are now used only for gardening by people
311 from the neighbouring small and crowded islands of Fotuha'a, Matuku
and Kotu; these people also occasionally hunt the wild pigs with which
136 Tofua is infested.
224

(6) KAO is an extinct volcanic island, a perfect cone like Egmont
133 in New Zealand and Fujiyama in Japan. The summit, called Tokonakao,
is 3,380 feet high, the highest point in the Tongan group, and easily
visible from Lifuka, 35 miles to the eastward. There was a village on
the island long ago, but on the shore, not on the summit as an old story
states. The narrow channel between Tofua and Kao is deep.

(7) LATE has a dormant volcano which has not erupted since
[131] 1854. Its area is over six square miles and height 1,700 feet; it has two
craters and a small lake. The peak is plainly visible for 50 miles on clear
[166] days, and has always been a landmark for navigators. Late was formerly
inhabited, but its people were taken to Huga, Vavau; it still
contains the remains of a fort with a stone wall. The island is very
fertile and densely-wooded.

[131] (8) FONUALEI is 40 miles N.W. of Vava'u and 600 feet high.
It was discovered by the Spaniard, Maurelle, in 1781; he named the
[175] island Amargura (Spanish for "bitterness"), because of his disappointment
in not getting food and water there. Though the volcano at Fonualei
[103] has been dormant for some years, in 1846 it threw ashes over such a
great area that the gardens in Vava'u were spoiled, and some ashes were
borne by the wind to ships as far as 500 miles away. The Government
166 now forbids habitation there and on the neighbouring small island, Toku.
Toku was formerly inhabited by refugees from Ha'amea, near Nafualu,
Togatabu, where tribal fighting often took place. The people of Toku
had gardens on Fonualei, but they now live at Utulei, Vava'u.

Disastrous hurricanes frequently occur, and the island has been ravaged as recently as December, 1930, February, 1931, and March, 1932. During the hurricane season Niua Fo'ou is not visited by small craft. Though the island has been so repeatedly devastated by eruptions and storms, and its condition seems to be more dangerous than that, for instance, of the uninhabited large island of Tofua, still there is no intention of abandoning it for a safer home closer to the main islands of the group. 731 [132] [166]

Its present population is 1,291. The inhabitants are a distinct type, with local variations of the Tongan language due to ancient contact with Samoa and Uvea, but more intercourse with the rest of the Tongan group is causing these old words to fall into comparative disuse. 162 197

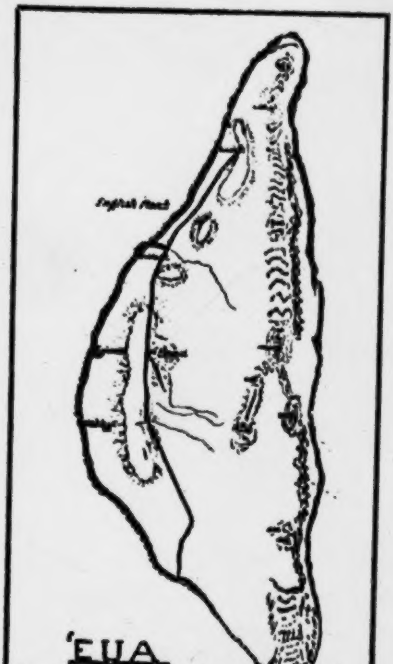
The "Tin-can Mail" is Niua Fo'ou's claim to distinction. As the harbour at Agaha is inconvenient, and the sea is generally too rough for canoes, the mail is taken by swimmers to the steamer which passes from Samoa to Fiji. The outgoing mail is generally wrapped in oiled paper and tied to sticks, and the inward mail is brought back from the steamer in a sealed tin-can. 205 [415]

THE CHIEF CORAL ISLANDS, WITH SCENIC AND HISTORIC PLACES.

133

'EUA. This island, which is of great age geologically, reaches a height of 1,078 feet, and has an area of 33 square miles. Although it is as large as Vava'u and contains fertile soil in abundance, its population of 348 is most disproportionate. Its inadequate harbour at 'Ohonua and the sometimes dangerous channel between the island and Togatabu, though disadvantageous to the progress of 'Eua, do not really explain the decline in its population; this is due rather to the proximity of Nuku'alofa with its attractions. Considering that many small islands in Ha'abai support numerous taxpayers who have no allotments, the neglect of 'Eua is regrettable.

'Eua was called Middelburg by its discoverer, Tasman, and Cook had a high opinion of its beauty and fertility. This island is unique in several respects. It has several small creeks which rise from springs in the hillsides and descend to the western shore;



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[TEXT CONTINUED ON PAGE 79]

Ha'ateiho is the place where three London Missionary Society 648
missionaries were killed in 1799. At Bea may be seen the spot where [797]
Captain Croker was killed and three naval guns were captured in 1840.

There is a good example of an old fort in fair preservation at Hule, 712
near Nukunuku. The most remarkable of the numerous trenches of the
island is known as the Keli-'a-Belehake, which extends from Vaotu'u to [173]
Nukunuku, Te'ekiu, Masilamea, and back to the southern coast at Fahefa;
tradition states that this was actually dug in a single night during a war
between the men of Hahake and those of Hihifo led by Vaha'i, at some
undetermined time probably in the early 19th century. The name of a 103
hamlet, 'Umutagata, also in the western district, recalls a rare instance 266
of human cremation and cannibalism. 764

At Kolovai there is the enclosure where the former Tu'i Kanokubolu
were invested with office; a piece of the koka tree under which these 643
kings sat has been placed in the modern coronation chair at Nuku'alofa. [764]
The tombs of these kings are also at Kolovai. This village is well-known
to tourists as a sanctuary for great numbers of flying-foxes. 136

Houma, on the south-west coast, is noted for the blow-holes which 133
extend along the cliffs for a considerable distance.

In the extreme north-west of the island, at Ha'atafu, a monument 648
stands to mark the landing-place of the first Wesleyan missionaries (1826). [211]
Tasman in 1643 and Cook in 1773 also landed nearby.

Navigation lights now stand at Ha'atafu, Nuku'alofa and Malinoa, 502
an island north of Nuku'alofa. The quarantine station is situated at
Makaha'a, another island off Nuku'alofa. 504

Ancient stone-quarries are to be seen at Motutabu and Bagaimotu,
small islands not far from Nuku'alofa. It seems more than probable 316
that the stones used in the great tombs (lagi) at Mu'a and elsewhere were 174
cut at these places, and certainly not at Uvea and other distant islands
to which old native traditions refer.

HA'ABAI. It is considered that this name is derived from Savai'i, 103
the island in Samoa from which the ancient Tongans probably came.
Ha'abai is a scattered archipelago of small islands, the total area of which 133
is less than that of 'Eua, if the uninhabited volcanic islands of Tofua and 131
Kao are excluded. Yet these islets support a population of 6,410, most
of whom have small tax-allotments or none at all, and despite the difficulties 162
of getting a livelihood—difficulties which hurricanes and droughts 311
have increased in recent years—the number of people who have gone to
take up land in Togatabu and Vava'u is not considerable. The people 505
of Ha'abai have always been renowned as skilful navigators and fishermen. 226

The Governor of Ha'abai resides at Bagai, Lifuka, which was also 634
the boyhood home and always the favourite residence of Tubou I. Cook
was entertained at a great festival and a plot was made against his life 175
on this island in 1777. Mariner's vessel, the "Port-au-Prince," was also
attacked here, and the cemetery of the murdered sailors is at Koulo, 648
Lifuka.

Uoleva, now uninhabited, has a remarkable number of pigeon-mounds 172
used by chiefs in ancient times, also an old sunken road of unknown
use extending through the island.

'Uiha is the burial-place of great chiefs, including Tubouniua, 764
Tubouto'a, Tevita 'Uga and Vuna. The finest mound ('eji) in Tonga,
named Maka Hokovalu, is situated on the north-west of this island. The 648
village of 'Uiha also boasts six cannon taken from a kidnapping ship which
met its merited doom while making a raid on the island about the middle
of the 19th century.

Tugua was the residence of the highest personage in ancient Tongan 644
society, the Tamaha.

Nomuka, in the south of the group, was visited by more voyagers 175
than any other island in Tonga. The pond of fresh water from which 648
Tasman, Cook, Bligh and others took supplies is readily pointed out. [312]

Navigation lights have been placed at Muifuiva, in the south, and 502
at Muitoa, Ha'ano, in the north of Ha'abai. Some islands cannot be
approached in bad weather. Many of the smallest ones are uninhabited, 311
though there are various traces of former habitation or of use for plantations
or burial-places at Ofolaga, Kelefesia and the 'Otu Tolu.

VAVA'U OR HA'AFULUHAO. Three-fifths of this beautiful 133
northern group is in one island, 'Uta Vava'u, but the remaining islands
are only separated from the mainland by narrow channels. All these
islands are comparatively high and undulating, thickly-wooded and very
fertile. The highest point is 670 feet. From the hill called Talau, behind
the chief town, Neiafu, a magnificent panorama can be obtained, embracing
all the islands in the group. Along the northern coast of the main
island there are very fine views from the high cliffs at the seat ('eji) of
Salote near Hologa and at Ha'alaufuli.

The harbour of the main island is one of the most picturesque in the Pacific, though shallows and sandbanks make navigation difficult in some places. The Swallows' Cave, often visited by tourists, is on the north of Kaba. The secret cave, entered only by diving, which Mariner's story and Byron's poem have made famous, is situated on the north of the island of Nuababu ; here the young chief left his bride until they could embark for Fiji and be safe from the wrath of their relatives.

Neiafu, the port and residence of the governor, is beautifully situated, 361
and good roads radiate from this centre. Until recently at least [184]
the average prosperity of the natives in Vava'u was rather higher than
in other parts of the group, and they have expended their resources on [434]
European houses and European food to a greater extent than elsewhere.
Vava'u is not as subject to hurricanes as the more northerly islands of 731
Niua Fo'ou and Niua Tobutabu, but nevertheless it has suffered rather
frequently, the last occasion being 13th March, 1932. 132

It is remarkable that Vava'u was the last part of Tonga to be 175
discovered, the honour falling to the Spaniard, Maurelle, in 1781. 648

Various places recall the incidents mentioned in Mariner's history, 669
and especially Feletoa, where the great fight of Finau Ulukalala II took
place and where Finau himself was buried in 1809. Parts of the great 133
trench, and also a cave and underground river, may be seen at Feletoa.

An ancient but incredible tradition states that a long wall of coral 349
stones at Makave, known as the Kilikilitefua, was made by casting a stone 172
for every first-born son in the district. 173

than the way in which they noose sharks ; instances of sharks attacking 226
natives are very rare. Whales are sometimes caught. Turtles are also 225
plentiful. Perhaps the most interesting creature in Tonga is a land-
tortoise, now kept in the Palace grounds at Nuku'alofa, and reputed to 231
have been left by Captain Cook ; it has been scarred by bush-fires and
other accidents, but in its old age it is honoured as though it were a chief 825
and is called Tu'imalila, after a part of Labaha called Malila. 552

The graceful coconut-palm is the most distinctive as well as the 245
most valuable of plants in Tonga. All parts of the islands being very
close to the sea, coconut trees thrive everywhere, and copra, the dried
kernel of the nut, is the staple product. Other plants which grow in 241
profusion are many varieties of banana, plantain, yam, sweet potato,
talo, manioc, sugar-cane, pineapple, breadfruit, papaw-apple, mango and
arrowroot. Coffee, cocoa and cotton have been introduced but are not
yet extensively grown. Various European vegetables have also been
introduced, and corn has proved the best cereal for this climate.

Bananas, sweet potatoes, pineapples, tomatoes, pumpkins and 439
oranges could be exported in abundance, if markets were available. The
staple foodstuffs of the people are yam, sweet potato, talo, manioc, kabe, 262
plantain, breadfruit, etc.

The bark of the paper-bark mulberry is extensively used for making 824
native cloth (taba and gatu), and the sap of the koka tree is used for [287]
stamping this cloth. Mats are made from the leaves of the pandanus,
but unfortunately this domestic manufacture is declining generally, [285]
except in Ha'abai. The trunks of the toa (ironwood) and koka are used [178]
for the posts of native buildings, but timber generally suitable for building [313]
European houses is not found in Tonga. The ironwood or casuarina
tree was used for making clubs and spears formerly, and is still used for
spade handles and mallets. The best of the old canoes were brought 505
from Fiji, where more suitable timber for all purposes is available. 439

Kava, the juice of a species of pepper-plant, is the national drink
on all occasions. Other interesting trees are the ovava, a species of 276
banyan ; gatae and tuitui (candle-nut) used for marking boundaries ;
Malayan apple or fekika, tava, and the ifi, whose leaves were hung round 137
the neck in token of surrender or penitence in olden times. 824

Government statistics in 1931 show a total of 2,658,644 coconut
trees and 832,655 banana plants in the Kingdom, 94% being owned by 245
Tongan cultivators.

EXPORTS.

Tonga is entirely an agricultural country, being without minerals 433
and secondary industries. It is unfortunate that there are still fairly
considerable areas of undeveloped land even in such a small country, 433
especially in Togatabu and 'Eua, and further that several hundred tax- 311
payers have no allotments ; this latter condition is mainly due to indolence
on the part of some who live in the chief towns, but in the case of the
overcrowded islands of Ha'abai it rises from rather a natural reluctance
to leave an old home. The Government is now making strenuous efforts 179
to enforce both more systematic cultivation of coconut-growing land and 245

134 These soils are found only along the low lying north coast of Tongatapu, and have been divided into two subgroups by Gibbs on the basis of drainage differences: dune or "Nuku'alofa soils" and soils of the low flats or "Sopu soils". Both have discontinuous distributions along the north coast.

The Nuku'alofa or dune soils range from very thin, loose, and rapidly draining sandy soils bordering the beach zone to more loamy and structured soils farther inland. The upper layers are brown in color due to the presence of humic material. The soil ranges in depth from one inch near the coast to 8 to 9 inches (20 to 23 centimeters) inland and, regardless of its depth, rests on yellowish coral sand.

The Sopu soils are subject to periodic inundation from excessive rain or high tides. The soils range from sands to loamy sands with one-half to one inch (one to 2.5 centimeters) of humus-rich topsoil under patches of salt tolerant vegetation. The flats that are somewhat higher and protected from the influx of sea water have dark brown to black sandy loam or silt loam over yellow [311] coral sand and rock. The Sopu soils of the lower areas are generally too saline to support agriculture, whereas the soils on the higher flats, although mostly less than 10 inches (25 centimeters) deep and waterlogged following heavy rains, are very fertile and are often cropped.

134 Although the differences between the Nuku'alofa and
242 Sopu soils seem to be obvious, Tongans generally refer to
them both as *tou'one*. Some waterlogged hydromorphic soils
134 are distinguished as *'umea* or *kelekele'umea*. Lowland soils
or *tou'one* range from highly alkaline to neutral in reaction
and are low in available nitrogen, phosphorus, and
potassium and high in available calcium and magnesium.
Citrus and some other crops show an iron deficiency in
some low-lying areas (Nakagawa, 1971) and most nutrients
[242] are easily depleted by heavy cropping. Nevertheless,
Tongans find these soils suitable for most crops except
yams, and particularly suitable for sweet potatoes.

[241] In short, the soils of Tongatapu, although somewhat
[182] deficient in certain nutrients, provide an excellent basis
for traditional Tongan agricultural practices. Furthermore,
owing to the well-drained nature of most of the soils and
the lack of relief, few if any cases of soils erosion are
encountered on the island.

241

Primary Vegetation

A major feature of traditional shifting agricultural
systems is the felling of trees and other vegetation and
burning of the dried remains. When yields begin to decline,
a new section of forests or bush is cleared.
241 Theoretically, if given a sufficiently long fallow or
137 intercropping period, the primary vegetation should re-

● 311

241 establish itself. Unfortunately, on Tongatapu, owing to
137 the limited land area, only in rare cases has the vegetation
311 been allowed to return to a near climax community,
and little of the original primary vegetation remains
except along the coast and in a few protected enclaves.
137 Even in these areas, the vegetation has probably been
altered to some extent by over 3000 years of Tongan
occupance (Groube, 1971: 313).

114 A number of comprehensive studies of the Tongan flora
128 have been made (Hemsley, 1894; Burkill, 1901; and Yuncker,
1959); these studies however, have focused on the identification
and listing of species and their uses and not
on plant communities and their areal distribution, which
is the focus of the following vegetational description.
The vegetation is here classified into eleven types
128 (Figure 8). These include primary vegetation types:
1) coastal littoral forest; 2) coastal savanna; 3) swamp
forest; 4) marshland; 5) mangrove swamps; 6) tropical
lowland forest; and secondary vegetation which is treated
separately. These types are based on physiognomic differences
that were observable on the ground and on 1: 20,000
black-and-white aerial photography. Each of these types
was studied on the ground and subsequently mapped utilizing
137 1968 aerial photography. These associations are not
241 all directly involved in the agricultural system, but
311 they do reflect the agricultural potential of the different

[TEXT CONTINUED ON PAGE 39]

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

Figure 8.

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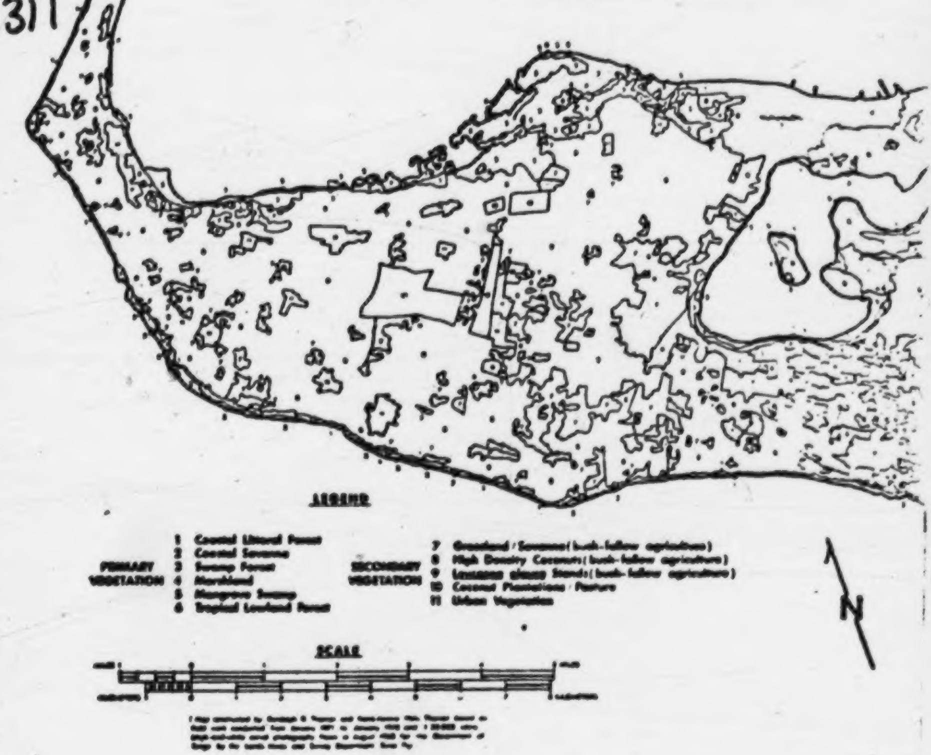
VEGETATION OF TONGATAPU ISLAND

KINGDOM OF TONGA


LEGEND
PRIMARY VEGETATION
1 Coastal Littoral Forest
2 Coastal Savanna
3 Swamp Forest
4 Marshland
5 Mangrove Swamp
6 Tropical Lowland Forest
SECONDARY VEGETATION
7 Grassland / Savanna (bush-fallow agriculture)
8 High Density Coconuts (bush-fallow agriculture)
9 Leucaena glauca Stands (bush-fallow agriculture)
10 Coconut Plantations / Pasture
11 Urban Vegetation
SCALE
MILES
KILOMETRES
N

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

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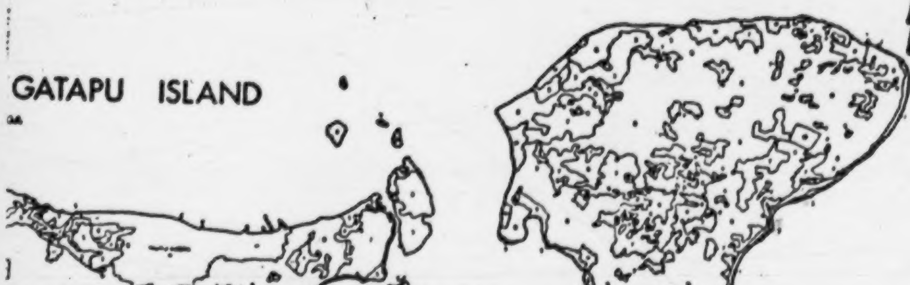
GATAPU ISLAND
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[p. 38-B]

137 portions of Tongatapu. Moreover, they serve as reservoirs 241 or gene pools for many plant species which are part of the [311] 128 agricultural system. (Appendix E[A] lists scientific, Tongan, common English names and the use of each plant species which was observed as being a major component of the flora.)

137 Coastal Littoral Forest

311 The coastal littoral forest is characteristically found on sandy or rocky soil in areas exposed to strong winds and salt spray. The major concentrations on Tongatapu are found along the east and west coasts of the island. 137 This association is characterized almost entirely by pantropic species that are common in the tropical Pacific Ocean.

On the sandy or rocky seaward edge of the forest, low, salt-tolerant vegetation predominates and depending on the particular area is comprised of the following dominant species: *Scaevola frutescens*, *Canavalia sericea*, *Ipomoea pes-caprae*, *Vigna marina*, *Wedelia biflora*, *Thuarea involuta*, *Spinifex littoreus*, *Pemphis acidula*, *Suriana maritima*, *Sesuvium portulacastrum*, *Euphorbia atoto*, *Cassytha filiformis*, *Fimbristylis cymosa*, *Derris trifoliata*, *Phaleria disperma*, *Vitex trifolia*, *Bikkia tetrandra*, *Colubrina asiatica*, and *Pandanus spp*.

Dense littoral forest generally begins directly behind this zone of low, salt tolerant vegetation and is characterized by larger trees including the following species: *Hibiscus tiliaceus*, *Macaranga harveyana*, *Barringtonia*

[A] [See Category 137, pp. 377-431--Analyst.]

137 asiatica, Ochrosia oppositifolia, Casuarina equisetifolia, Thespesia populnea, Acacia simplicifolia, Tournefortia argentea, Hernandia ovigera, Calophyllum inophyllum, Desmodium umbellatum, Morinda citrifolia, Heritiera littoralis, Myristica hypargyraea, Premna taitensis, Gymnosporia vitiensis, Planchonella costata, Canthium barbatum, Guettarda speciosa, Cordia subcordata, Cerbera manghas, Ximenia americana, Terminalia catappa, Grewia crenata, Pisonia grandis, Pipturus argenteus, Pandanus tectorius, Mertya macrophylla, and Ficus scabra.

The outer edges of the forest are often fringed with concentrations of Pandanus spp. The understory of this littoral forest includes such species as: Acrostichum aureum, Piper puberulum, Derris trifoliata, Clerodendrum inerme, Centella asiatica, Achyranthes aspera, Epipremnum pinnatum, and Pandanus. In open areas and on the inland margin of this forest, there is a common appearence of weedy secondary vegetation dominated by Lantana camara, Carica papaya, Solanum verbascifolium, Passiflora spp., and Canavalia maritima.

241
311 Owing to the predominance of rocky or sandy soil and excessive salt spray, the sites suitable for this littoral forest and associated salt-tolerant scrub vegetation are unsuitable for agriculture. Nevertheless, some bush allotments ('api 'uta) include considerable portions of this marginal land, and unsuccessful attempts are often made to farm it.

000 made to farm it. The characteristic plant species do,
311 however, provide a valuable resource to the owner in terms
824 of timber, medicinal plants, pandanus fiber, plaited-ware,
wood for carving, and many other useful products.

137 Coastal Savanna

311 The coastal savanna vegetation is restricted to a
narrow zone of flat limestone terraces along the south and
east coasts, which is continually under the influence of
137 intense salt spray. Along the seaward margin, the vegetation on the exposed coral limestone is similar to the outer margins of portions of the coastal littoral forest. The vegetation is characteristically prostrate, with *Pemphis acidula*, *Sesuvium portulacastrum*, *Portulacca samoensis*, and *Fimbristylis cymosa* predominating among the cracks and shallow soil pockets in the limestone. The savanna itself, which never extends much more than 100 yards (90 meters) inland, is comprised of an understory of grasses including *Spinifex littoreus*, *Thuarea involuta*, and *Ischaemum murinum* along with *Wedelia biflora*, *Canavalia sericea*, *Vigna marina* and *Cassytha filiformis*. Throughout this understory of low herbaceous vegetation, scattered concentrations of *Pandanus tectorius*, *Scaevola sericea* and *Tournefortia argentea* occur. Immediately inland from the open savanna vegetation are found almost pure stands of *Pandanus tectorious*, which grade into coastal littoral
[311] forest. The coastal savanna, of all the vegetation

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associations on Tongatapu, has possibly the lowest agricultural potential.

Swamp Forest

Areas of swamp forest are found primarily in the low lying areas along the north coast, with particularly extensive concentrations near Navutoka, Folaha, and between

137 [134] [133]

Kolomotu'a and Fatai. These are characteristized by hydromorphic soils which are inundated from time to time throughout the year due to the excessive rain and tidal oscillations. The type is characterized by an open to semi-closed forest with an understory of salt tolerant shrubs. The dominant trees in this type are: Excoecaria agallocha, Xylocarpus granatum, Hibiscus tiliaceus, Thespesia populnea, Lumnitzera littorea, Heritiera littoralis, Ficus prolixa, Inocarpus edulis, Psidium guajava, Pandanus tectorius and Rhizophora spp. In the more mesic areas, the predominant species are Xylosma orbiculatum, Macaranga harveyana, Santalum yasi, Grewia crenata, Rhus taitensis, Morinda citrifolia, Glochidion sp., Ficus sp., Hibiscus tiliaceus, Cerbera manghas, Syzygium dealatum, and Diospyros ferrea.

Throughout the swampy areas, the understory consists of Cyperus javanicus, Ischaemum murinum, Paspalum conjugatum, Eleocharis dulcis, Acrostichum aureum, Derris trifoliata, Vitex trifolia, Clerodendrum inerme, and

137 *Psidium guajava*. In the more mesic and open areas, the understory consists of *Lantana camara*, *Indigofera suffruticosa*, *Psidium guajava*, *Stachytarpheta urticaefolia*, *Passiflora* spp., *Ipomoea* spp., and *Canavalia maritima*. In both swampy and more mesic areas, exotics such as *Lantana camara*, *Psidium guajava*, and *Stachytarpheta urticaefolia* have become naturalized and constitute dominant species.

311 241 [134] The areas covered by swamp forest have in some cases been reclaimed by diking and refilling and, owing to the high organic content of the soil, produce high crop yields if waterlogging can be avoided. Many bush and town allotments contain portions of this swamp forest and, in most cases, although considered marginal for farming, provide a source of many plant products used by the Tongan society.

137 [311] [133]

Marshland

Marshland associations, very limited in extent, are found south of Folaha and in the area just west of Kolomotu'a and north of the village of Hofoa. These have standing water throughout most of the year; the water is sometimes brackish owing to tidal ingression. The predominant species in this association are *Cyperus javanicus*, *Ischaemum murinum*, *Paspalum conjugatum*, *Coix lachryma-jobi*, *Eleocharis dulcis*, and *Jussiaea erecta*, with scattered *Psidium guajava*, *Lumnitzera littorea*, *Hibiscus tiliaceus* and *Excoecaria agallocha*. Again, exotics such as *Psidium*

137 *guajava* and *Paspalum conjugatum* have become naturalized and
311 constitute dominant species. The areas in which this
association occurs have no agricultural potential, unless
[228] reclaimed. Such lands are presently being developed as
fish ponds.

137 311 *Mangrove Swamp*

Zones of mangrove swamp are found along the sheltered
margins of the north coast, extending from Kolovai in the
west to Navutoka in the east, and including areas surrounding
137 Nuku'alofa and the interior lagoon. This association
[133] consists of trees actually growing in salt or brackish
water on a muddy substratum below the limits of high tide.
Although it merges on its inner margins with representatives
of the swamp forest association, the mangrove swamp
is generally lower and more gregarious, composed largely
of only *Rhizophora mangle*, *Rhizophora mucronata*, and
311 *Bruguiera conjugata*. These areas have little or no agri-
313 cultural potential unless reclaimed, although valuable dyes,
timber, and firewood are obtained from the mangrove species.
A number of bush allotments have sections of mangrove swamp
and, with the shortage of timber trees, these swamps have
become the major source of firewood on the island.

137 311 *Tropical Lowland Forest*

Presumably the entire well-drained central upland was
originally covered with dense tropical lowland forest.
Today, however, there are only remnants of primary forest.

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

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The two major concentrations are found just west of the airport at Fua'amotu on the property leased by Tupou College and on the Royal Estate at Kauvai bordering the central lagoon. There are numerous other smaller stands throughout the island, some too small to be mapped. The presence of these isolated stands can in some cases be attributed to the traditional practice of preserving small groves for family burial grounds or to the belief, held by many Tongan farmers, that if all of the native forest species and their shade are removed, the soil will cease to be fertile.

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The remnants of this tropical lowland forest have a characteristically closed canopy composed of trees reaching heights of over 60 feet, a limited understory, and a number of epiphytes and lianas. The dominant tree species are Rhus taitensis, Alphitonia ziziphoides, Elaeocarpus tonganus, Ellattostachys falcata, Aleurites moluccana, Ervatamia orientalis, Dysoxylum forsteri, Syzygium clusiaefoluim, Grewia crenata, Tarenna sambucina, Xylosma orbiculatum, Vavaca amicorum, Santalum yasi, and Ficus spp. Outer margins and more open areas are dominated by secondary species such as Hibiscus tiliaceus, Glochidion spp., Macaranga harveyana, Morinda citrifolia, and Bischofia javanica.

The understory in the dense inner forest, where present, consists of Micromelum minutum, Jasminum

137 simplicifolium, Alyxia stellata and Dryopteris invisa. Lianas and epiphytes include Fntada phaseoloides and Asplenium nidus. A fungus, Auricularia polytricha, is also found growing on dead logs during rainy spells. In the more open and cutover sites, the exotics Lantana camara and Psidium guajava plus Passiflora maliformis, Dioscorea bulbifera, Digitaria pruriens, and Paspalum conjugatum are among the dominant understory species and often form dense thickets.

311 Regardless of the species composition, these remaining stands of tropical lowland forest represent probably the best potential agricultural land on Tongatapu with [241] respect to soil fertility. These areas have either never been cultivated or have been under fallow for sufficient time to allow for considerable replenishment of organic [313] material and plant nutrients. Furthermore, these stands are valuable sources of timber, firewood, and traditional [439] medicines. The dried fungus is exported to Hong Kong.

Plant Species Important in Cropland and Secondary Vegetation

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The cropland and secondary vegetation, which comprise over 90 percent of the total land area of Tongatapu, are characterized by a succession of gardens and fallow areas in various stages of regrowth. A detailed description of this vegetation , which is comprised largely of introduced species, constitutes much of the core of this dissertation.

CHAPTER III

CULTURAL SETTING AND POPULATION CHARACTERISTICS

Historical Background

172 Based on archeological evidence, proto-Tongan culture
has been operative on the Tongatapu environment for over
3000 years. The earliest inhabitants, however, were pro-
bably not cultivators. Kitchen middens and potsherds
indicate that the earliest settlements were along the
shores of the central lagoon and that inhabitants depended
almost entirely upon reef food (Groube, 1971:295-313).
There is no evidence in early Tongan or Samoan excavations
that vegetables foods were even utilized in the diet (Suggs,
174 1960:91). At a later date, possibly in the latter half of
the first millenium B.C., a shift from reef exploitation to
agriculture may have coincided with the introduction of
some of the major Western Pacific cultigens, as well as the
pig (Groube, 1971: 311-313).

174 From the time of this supposed shift from a restricted
175 maritime lagoonal economy to a horticultural economy until
361 well after the first European contact by Abel Tasman in
1643, the settlement pattern was probably one of dispers-
175 ed houses and gardens throughout Tongatapu. Tasman was very
311 favourably impressed with the industry of the Tongans. The
361 land was cultivated everywhere, and there were no villages.

175 Each man lived in his own garden, the allotments being
361 separated by reed fences (Wood, 1945:81-19). After Tasman's
● 311 visit, a period of 130 years elapsed before further European
contact was made by Cook on his second voyage in 1773.
Cook also recorded that Tongatapu was extensively cultivated
with "the houses being surrounded by perfumed flowers and
set in the middle of food-gardens, the planting being
systematic and in rows . . . . . . Good roads, arched over
with trees, went in all directions. There were no villages."
175 (Wood, 1945:18-19). The existence of dispersed and peaceful
361 settlements is attested to by Tongan tradition which "speaks
173 of a time when it was possible to communicate from one end
203 of Tongatapu to the other by calling from one farm to another,
a state of affairs described as fanogonongo tokoto
(making a proclamation while reclining)" (Gifford, 1929:4-5).

174 During this period of dispersed settlement, a strong
642 line of high chiefs established their authority over Tongatapu,
643 as well as the Ha'apai and Vava'u groups. This
period of strong central authority began with the first Tu'i
Tonga, 'Aho'eitu, around 950 A.D. (based on geneological
175 evidence). The line of high chiefs, starting with 'Aho'eitu
721 and including three major lines of royalty (the Tui'i Tonga,
Tu' Ha'atakalaua, and Tu'i Kanokupolu lines), provided for a
181 peaceful environment until the very end of the eighteenth
[643] century (Wood, 1945:5-18). According to Tasman, in 1643,
"we saw with these people no weapons, so that all was peace

Population Distribution

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The distribution of population also has an effect on the nature of the agricultural system. Since European contact, there have been major Kingdom-wide changes in the distribution of the population, as well as changes within each island group.

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162
[166]
Immigration from the outer islands has resulted in a disproportionate growth of Tongatapu's population. Population figures from four censuses (Table 7) show that whereas Tongatapu had just over 40 percent of the Kingdom's population in 1921, it now has over 60 percent. From 1956 to 1966 population growth in the outer islands was less than one-third that of Tongatapu. During these ten years, population growth has been 76 percent in the capital city of Nuku'alofa and environs; even in rural Tongatapu, the growth rate of 43 percent is greater than that of the Kingdom as a whole (Tupouniua, 1958:42-45; Fiefia, 1968:38-42).

166
369
Incentives for migration to Tongatapu and especially to Nuku'alofa include: better educational and recreational facilities; opportunities for wage labor; better transportation and chances to go overseas; more developed network for marketing agricultural products locally and overseas; and the general aura and excitement of urban life.
161
162
182
311
Regardless of the motives for population redistribution, the effect on Tongatapu's agriculture is considerable, and there is an increased demand for land and a burgeoning landless class on Tongatapu.

423 Minister, into 56 4 1/8 acre (1.7 hectares) allotments; and
11 other 4 acre (1.6 hectares) allotments resulting from
subdivision of expired leasehold land southeast of Utulau.

423 Town allotments, which are supposed to be 2/5 acre
361 (0.2 hectares) in size, are located in the 59 town reserves
throughout Tongatapu (Figure 3).[A] Each of these town
reserves is subdivided into numerous town allotments or
[128] '*api* *kolo*. Figures 10 and 11 are examples of the subdivision of the town reserves of Houma and Kolonga into
[127] individual town allotments ('*api* *kolo*). There is very
little information regarding the exact number and acreage
of town allotments on Tongatapu. Nevertheless, based on
figures in the *Report of the Lands and Survey Department*
(Government of Tonga, 1971a:Appendix I), there are probably
[114] between 4,000 and 5,000 town allotments. Hardaker (1971:25)
[162] quotes a figure of over 13,000 town allotments for Tongatapu, but this seems unlikely considering that the total
number of households on Tongatapu, at the 1966 census, was
only just over 6,000. Most allotments are probably close
to the statutory size although there are many oversized and
undersized allotments.

423 The portions of hereditary estates which have been
311 reserved for the holders and their families comprise about
3,100 acres (1,255 hectares). These parcels are generally
used for food or commercial crops. In some cases, the land
has been put into plantations for the production of copra

[A] [See Category 361, p. 14--Analyst.]

[TEXT CONTINUED ON PAGE

423
311
[427]
[178]
and grazing of cattle. A considerable portion of the unsubdivided land now held by the nobles was in former European leaseholdings, which were not renewed. At present, much of this land is underutilized and many of the coconut plantations have deteriorated since the termination of the leases.

423
427
[178]
In the past, there were over 8,000 acres (3,200 hectares) of leasehold land on Tongatapu, but the acreage continues to decrease as leases expire without renewal. Based on records in the Lands and Survey Department, there are at present 162 leases, sub-leases or permits over 2 acres in size, comprising an area of approximately 4,900 acres (2,000 hectares). There are other smaller leases which are of little or no agricultural value. [563] Of these 162 leases, 67 are held by church or missionary societies and 46 by aliens, including resident Europeans and other Pacific Islanders.

423
311
Most large lease holdings are used as copra plantations and for grazing. Some of the larger holdings and many smaller holdings are used as banana plantations, some for traditional Tongan agriculture, some for the production of garden vegetables for overseas export, and perhaps as much as 20 percent of the total area for non-agricultural purposes such as church and school sites.

sixty were classed as being engaged primarily in agriculture 162
for household consumption and export. This is a figure for 423
the total population, including men who reside in the towns. 241
As Walsh points out in a paper entitled "A Tongan Urban
Peasantry?",

> Town dwellers are inescapably bound up with the land.
> They own it as much as villagers, they rely on it to [465]
> supplement wages kept low on the assumption of an
> additional income from agriculture, they value it as
> a means of fulfilling family obligations and as a
> measure of their social importance and they depend on
> it for food (1969: 93).

The figures on external trade (quoted earlier) further 439
indicate the role of agriculture in the Tongan economy: 423
throughout the 1960s, bananas and coconut products made up
over 90% of the value of Tonga's exports. Furthermore,
there are no grounds for anticipating the development of
non-agricultural exports on any significant scale. In the 315
late 1960s, much hope was based on the possibility that explorations for oil would prove fruitful. This has not yet
materialized, however. And in trying to develop non- 439
agricultural industries, Tonga is in the difficult position
of having to compete with Fiji and Western Samoa, both of
which enjoy relatively large home markets and are also more
advantageously placed to export their goods.

In view of Tonga's dependence on agriculture both for 311
subsistence and export, the rising population figures are 161
cause for concern about increasing pressure on land as an 241
agricultural resource. A figure for 1963 gives the extent [134]

of land suitable for cultivation as amounting to 92,447 311
acres, approximately 60% of the total land area (Great 161
Britain 1965: 21), and it is unlikely that arable land can 241 [134]
be increased significantly. This means that higher yields of subsistence crops are required from existing acreage if the extent of land under cash crops is not to be reduced, and geographers have already documented changing patterns of land use and cultivation in Tonga (Maude 1970, 1973; Thaman 1976).

The question arises whether there is a shortage of 423
land. 'Land shortage', however, is not something that can 121
directly and unequivocably be infered from figures on population density. Rather, it implies a scarcity of land to meet local needs given the available technology, and varies with the definition given to 'scarcity' and 'local needs' as well as being dependent upon practices of land use and the level of technology. In the case of Tonga, however, the definitional problem falls away, for there is a readily available index of land shortage. According to 423
Tongan law, every Tongan male aged sixteen and over is [651]
liable for an annual poll-tax, and every poll-tax payer is entitled to an allotment of agricultural land measuring 100 fathoms by 100 fathoms (approximately 8¼ acres).
Whether there is sufficient land to provide these allotments [162]
can be taken as a criterion of whether or not there is a shortage of land, and by this criterion there is a definite

Chiefs, and the institution of a landed nobility. The 642
third section of the Constitution deals with the operation
of the new system of land tenure associated with the newly-
created nobility.

The creation of the landed nobility was built in to 642
the radically reorganized system of land tenure (Lātūkefu 423
1974, Rutherford 1971, Maude 1971). The entire country 565 [311]
was divided into tracts of land designated for agricultural
purposes and tracts designated for residential purposes,
bush land (*'uta*) and town land (*kolo*). All town land was [427]
to be the property of the government, who would lease land
in residential areas to those who wished to dwell there.
Bush lands were divided into large parcels of land known as
tofia ('inherited estate'), most of which were vested in
individual nobles. Allotments of agricultural land could [427]
be obtained by leasing them from the owner of the *tofia*.
The intent of these provisions, as Rutherford explains it,
was to create

> . . . a peasantry with secure tenure of portions of land adequate to satisfy their needs and free from chiefly demands and encumbrances, and a nobility with holdings large enough to satisfy their relatively higher demands for status and remuneration (1971:99).

The new system of land tenure was an instrument of [425]
security for the state, for it reinforced long-standing [609]
prohibitions by Tāufa'āhau against the sale of Tongan land
to foreigners. However, the institution of leasehold set [427]
aside the principle of life-long security of tenure for

49: Rogers A-4,5 (no date) 1969 OU9 Tonga OU9

161 Kingdom's total population, had 58.9% of the total households with two 162 family units and 63.2% of the households with three or more family units. The Report does not distinguish whether households with several 592 families have come about as a result of grandparents, son and wife, and grandchildren living in the same household, or as a result of brothers and their wives sharing one household. It is also unclear how the local census officers demarcated dwelling units clustered together and cooperating as the one single household. In many parts of Tonga there is a precedent in custom for three or even four generations of the same kin-group to live within the same *'api*, the family unit of the oldest son occupying the main dwelling with other units (parents and unmarried siblings; families of [593] married siblings) having separate dwellings around. Because of the traditional brother-sister *tapu* there may be an additional hut for unmarried sons. There is less precedent in Tongan custom for two or more family units of the same generation (e.g. siblings, their spouses and children) to live within the one dwelling: this could be a criterion of overcrowding.

It seems from the census figure of 16% ("households" with more than one family unit) that overcrowding is not yet severe in Tonga except in [342] Nuku'alofa. Here families of siblings are sharing dwellings, and huts are being built on swamp land. Elsewhere, the occurrence of households containing more than one family unit may be accounted for as the persistence of the traditional co-resident extended family, comprising several generations where each "extra" family unit may have its own separate dwelling house which may or may not have been recorded in the census schedule as a household. The increase in average household size has been accompanied by a fall in average overall acreage of land per household from 15.08 acres per household in 1956, to 10.98 acres in 1966.

* * *

121 The population densities already discussed have little meaning except in relation to the availability and utilization of natural, agricultural and 13 human resources. The natural resources of Tonga comprise almost 311 exclusively the soils, reefs and surrounding seas with, in late 1968, an elusive possibility of oil; the agricultural resources comprise almost entirely trees—particularly coconut, banana, breadfruit—and ground crops grown mainly without mechanical aids by slash-and-burn methods. 128 Human resources are discussed at the end of this paper.

Dependence on agricultural produce is enormous; in 1961 and 1964 433 [339] these products amounted to 98.19% and 96.39% respectively of Tonga's total export earnings with copra (the dried kernel of the coconut) forming the basis of the economy and constituting over 80% of the visible exports [241] throughout the 1960s.[6] Agricultural products are the surpluses and small cash-crops of Tonga's 12,000 or so peasant farmers who are scat- [463] tered throughout the Kingdom and rent their allotments either from titled [427] nobles or directly from the Government.

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[6] TONGA, 1960-1967 *passim*. Total exports for 1961 amounted to £T1,374,658; agricultural exports £T1,349,461; non-agricultural exports £T25,197.

423 ●311 The land reserved for government purposes includes some that is used agriculturally, such as lands of the government secondary school, Atele, in Ha'ateiho, the prison farm at Huatolitoli, and the Government Farm south of Vaini. The nature of the agricultural production differs considerably from that as practiced on the smaller bush allotments, and most of the land is not used in a traditional Tongan manner.

423 Table 10 summarizes land tenure on Tongatapu. Crown Land includes swamp and waste areas, shoreline and beaches, government departments, schools, airfields, and leases less than two acres in area. Using the estimated number of 4,000-5,000 town allotments and the average statutory acreage of 2/5 acres, town allotments would probably total 1,600 to 2,000 acres (650 to 810 hectares).

There remains the question of how effectively the system provides secure tenure to those Tongans who desire land for agriculture. Although the law states that each Tongan male, sixteen years of age or over, is entitled to both a bush and a town allotment, this is impossible.

In 1971, there were only 5,652 bush allotments, claimed or unclaimed, on the entire island of Tongatapu. [162] Yet five years earlier at the time of the 1966 census, there were already 12,322 eligible male holders. In 1966, only 39 percent of the eligible males on Tongatapu had allotments. The percentage on other islands was somewhat higher, 423 Survey of 1957, the estate holder has allowed a relatively high percentage of the allotments to be registered.

The area with the lowest proportion of registered allotments is around Fatumu and Have'uliku, where subdivision has not been completed and tenure to many parcels is on a customary basis. There seems to be little significant difference in the percentage of households having only temporary tenure, except for Kolonga, where the percentage
[311] was 35. Kolonga is one of the major banana growing areas,
[245] as well as being well-organized on a village basis for
[427] production of cash crops. Likewise, out of seven allotments which were rented, five were in the Kolonga district, where successful local enterpreneurs have rented allotments from other villagers.

[592] In summary, although the number of allotments in Tonga is insufficient, most households have some access to land,
241 either permanently or temporarily. Futhermore, although
311 strictly forbidden by law, renting land to those who are
423 landless or industrious enough to farm more land often
427 intensifies utilization of the land that is available.
241 Because of varying permanency of tenure, different kinds of
311 cropping, ranging from almost purely subsistence gardening
423 to purely commercial agriculture, occur throughout the mosaic-like patterm of over 5,000 bush allotments. The permanency of tenure of town allotments is also often reflected in the degree to which trees and long-term crops

423 are planted in dooryard gardens. Because the law which
311 requires that the allotments be kept in a reasonable state
241 of cultivation is not enforced, many allotments are underutilized or have not been used for extended periods of
423 time. These allotments are often held by wage earners, "in trust" for sons who are too young to utilize the allotments, or by individuals who have left Tonga to work or reside overseas.

Table 14. Class of tenure to bush allotments held by sample households.

Village	Registered	Un-Registered	Temporary	Rented	Total
Haveluliku	3	4	2	0	9
Fatumu	3	23	6	0	32
Kolonga	15	2	12	5	34
Houma	9	12	5		27
Kolovai	11	2	4	0	17
Ha'ateiho	10	6	3	1	20
Kolomotu'a	6	3	2	0	11
Kolofo'ou	13	1	36	0	17
Ma'ufanga		1	1	0	7
TOTAL	75	54	33	6	174

CHAPTER IV

PLANT ASSOCIATIONS AND AGRICULTURAL PRACTICES ON BUSH ALLOTMENTS

128 The purpose of this chapter is to look at the cumulative effect of the three input variables: the physical environment, the cultural setting and economy, and the pool of available plant species. The survey of 101 bush allotments provided the data on which most of the description and analysis is based.

241 311 137 The characteristic vegetation pattern of the bush allotment can be described most simply as a dynamic mosaic of plots containing a great variety of subsistence and cash crops within a matrix of secondary vegetation in various stages of regrowth. Throughout this mosaic of cultivated plants and secondary vegetation are scattered a variety of useful tree species which are cultivated or protected by Tongan farmers. The diversity of plant associations found on Tongatapu is well illustrated by a transect of a 2.04 mile (3.29 kilometers) portion of Tongatapu in the area of Veitongo. The transect extends from the coastal littoral forest of the upraised southern coast to the mangrove swamps of the low-lying northern coast (Figures 12 and 13). There are many crops, crop combinations, stages of secondary regrowth and scattered tree species found on this portion of the island. In

[TEXT CONTINUED ON PAGE 198]

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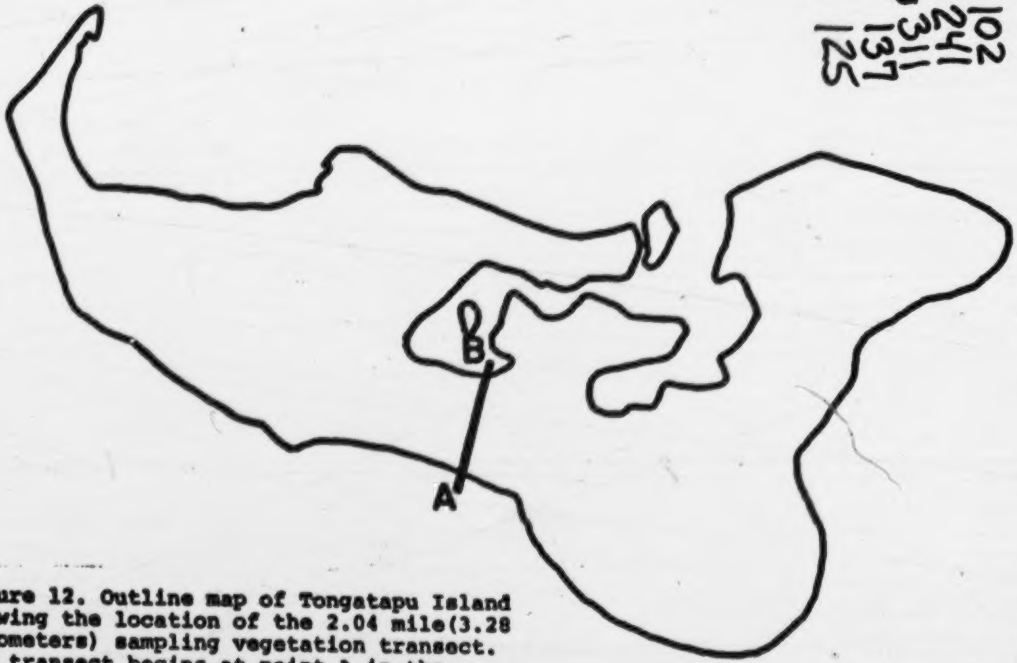

Figure 12. Outline map of Tongatapu Island showing the location of the 2.04 mile(3.28 kilometers) sampling vegetation transect. The transect begins at point A in the coastal littoral forests of the upraised south coast and ends at point B in the mangrove forests along the low-lying north coast.

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

128
137
241
● 311
102

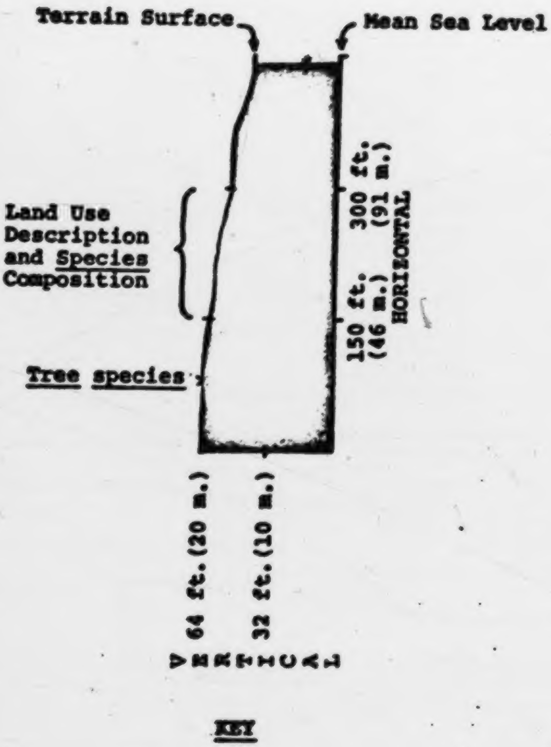
Terrain Surface
Mean Sea Level
Land Use Description and Species Composition
Tree species
150 ft. (46 m.)
300 ft. (91 m.)
HORIZONTAL
64 ft. (20 m.)
32 ft. (10 m.)
VERTICAL
KEY

Figure. 13. Tongatapu land use and vegetation transect and key.

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

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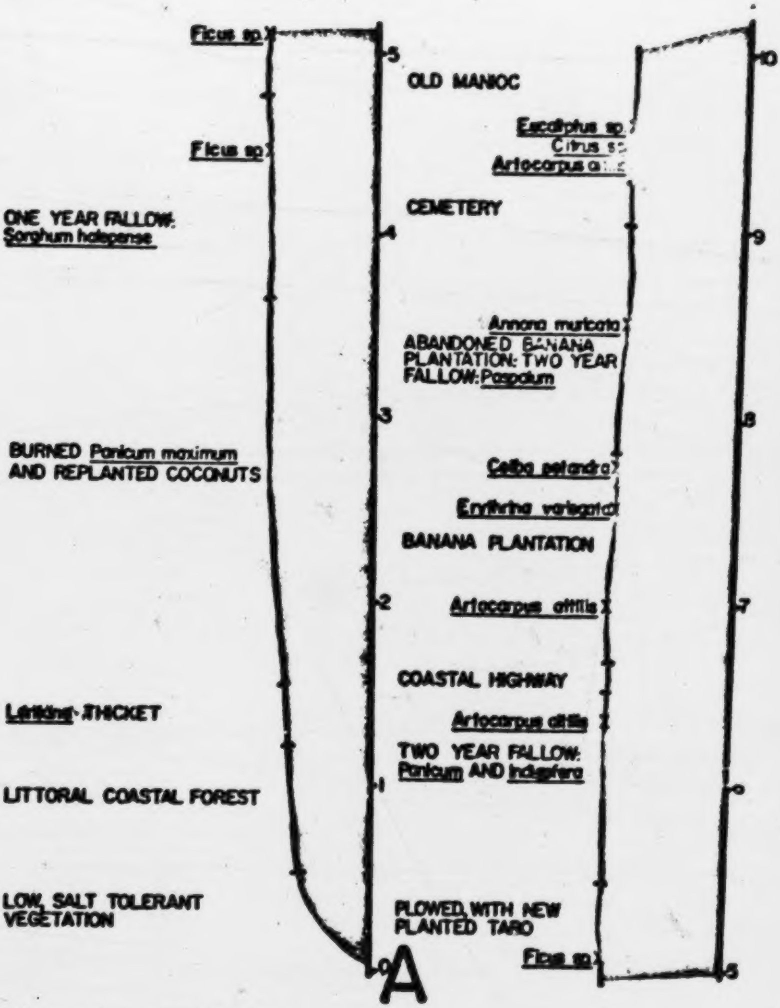
Ficus sp.
5
OLD MANIOC
Ficus sp.
ONE YEAR FALLOW: Sorghum halepense
CEMETERY
4
Eucaliptus sp.
Citrus sp.
Artocarpus altilis
10
9
Annona muricata
ABANDONED BANANA PLANTATION: TWO YEAR FALLOW: Paspalum
3
8
BURNED Panicum maximum AND REPLANTED COCONUTS
Ceiba petandra
Erythrina variegata
BANANA PLANTATION
2
Artocarpus altilis
7
COASTAL HIGHWAY
Lantana THICKET
Artocarpus altilis
TWO YEAR FALLOW: Panicum AND Indigofera
1
6
LITTORAL COASTAL FOREST
LOW, SALT TOLERANT VEGETATION
PLOWED, WITH NEW PLANTED TARO
Ficus sp.
0
5
A

Figure 13. Continued .

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● 311
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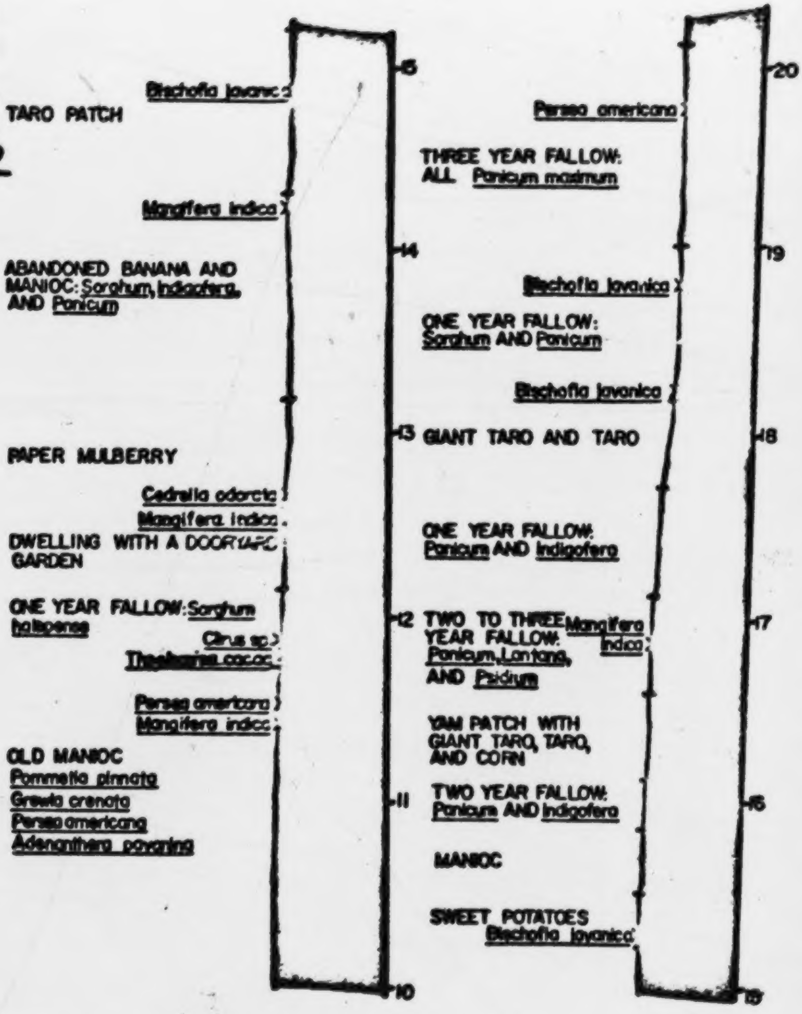
15
Bischofia javanica
TARO PATCH
Mangifera indica
14
ABANDONED BANANA AND MANIOC: Sorghum, Indigofera, AND Panicum
13
PAPER MULBERRY
Cedrella odorata
Mangifera indica
DWELLING WITH A DOORYARD GARDEN
ONE YEAR FALLOW: Sorghum halepense
12
Citrus sp.
Theobroma cacao
Persea americana
Mangifera indica
OLD MANIOC
Pommetia pinnata
Grewia crenata
Persea americana
Adenanthera pavonina
11
10
20
Persea americana
THREE YEAR FALLOW: ALL Panicum maximum
19
Bischofia javanica
ONE YEAR FALLOW: Sorghum AND Panicum
Bischofia javanica
18
GIANT TARO AND TARO
ONE YEAR FALLOW: Panicum AND Indigofera
17
TWO TO THREE YEAR FALLOW: Panicum, Lantana, AND Psidium
Mangifera indica
YAM PATCH WITH GIANT TARO, TARO, AND CORN
16
TWO YEAR FALLOW: Panicum AND Indigofera
MANIOC
SWEET POTATOES
Bischofia javanica
15

Figure 13. Continued.

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

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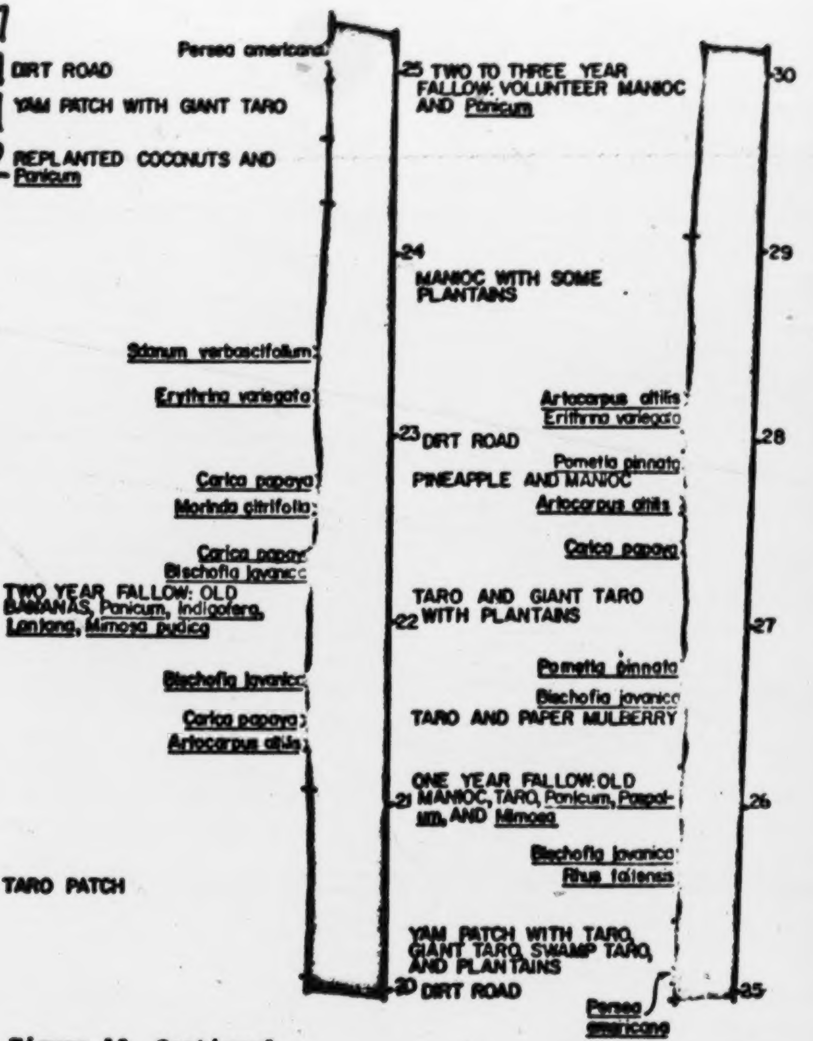
Persea americana
DIRT ROAD
YAM PATCH WITH GIANT TARO
REPLANTED COCONUTS AND Panicum
25 TWO TO THREE YEAR FALLOW: VOLUNTEER MANIOC AND Panicum
30
24
MANIOC WITH SOME PLANTAINS
29
Solanum verbascifolium
Erythrina variegata
Artocarpus altilis
Erithrina variegata
23 DIRT ROAD
28
Pometia pinnata
Carica papaya
PINEAPPLE AND MANIOC
Morinda citrifolia
Artocarpus altilis
Carica papaya
Carica papaya
Bischofia javanica
TWO YEAR FALLOW: OLD BANANAS, Panicum, Indigofera, Lantana, Mimosa pudica
TARO AND GIANT TARO WITH PLANTAINS
22
27
Pometia pinnata
Bischofia javanica
Bischofia javanica
Carica papaya
TARO AND PAPER MULBERRY
Artocarpus altilis
ONE YEAR FALLOW: OLD MANIOC, TARO, Panicum, Paspalum, AND Mimosa
21
26
Bischofia javanica
Rhus taitensis
TARO PATCH
YAM PATCH WITH TARO, GIANT TARO, SWAMP TARO, AND PLANTAINS
20 DIRT ROAD
25
Persea americana

Figure 13. Continued.

137
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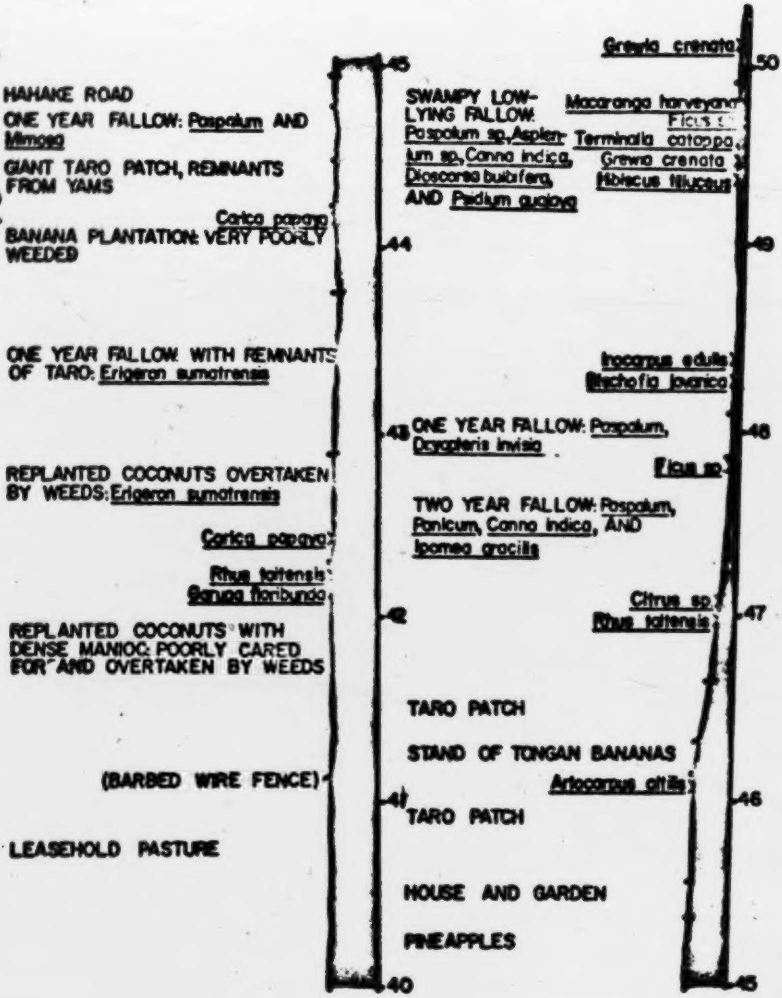
HAHAKE ROAD
ONE YEAR FALLOW: Paspalum AND Mimosa
GIANT TARO PATCH, REMINANTS FROM YAMS
Carica papaya
BANANA PLANTATION: VERY POORLY WEEDED
ONE YEAR FALLOW WITH REMNANTS OF TARO: Erigeron sumatrensis
REPLANTED COCONUTS OVERTAKEN BY WEEDS: Erigeron sumatrensis
Carica papaya
Rhus taitensis
Garuga floribunda
REPLANTED COCONUTS WITH DENSE MANIOC: POORLY CARED FOR AND OVERTAKEN BY WEEDS
(BARBED WIRE FENCE)
LEASEHOLD PASTURE
45
44
43
42
41
40
SWAMPY LOW-LYING FALLOW: Paspalum sp., Asplenium sp., Canna indica, Dioscorea bulbifera, AND Psidium guajava
ONE YEAR FALLOW: Paspalum, Dryopteris invisa
TWO YEAR FALLOW: Paspalum, Panicum, Canna indica, AND Ipomea gracilis
TARO PATCH
STAND OF TONGAN BANANAS
TARO PATCH
HOUSE AND GARDEN
PINEAPPLES
Grewia crenata
Macaranga harveyana
Ficus s
Terminalia catappa
Grewia crenata
Hibiscus tiliaceus
Inocarpus edulis
Bischofia javanica
Ficus sp.
Citrus sp.
Rhus taitensis
Artocarpus altilis
50
49
48
47
46
45

Figure 13. Continued.

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● 311
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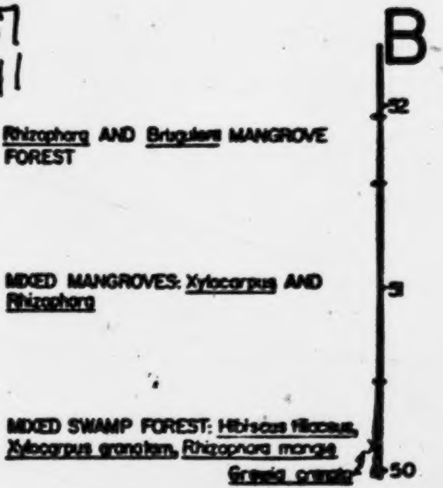
B
52
Rhizophora AND Bruguiera MANGROVE FOREST
51
MIXED MANGROVES: Xylocarpus AND Rhizophora
MIXED SWAMP FOREST: Hibiscus tiliaceus, Xylocarpus granatum, Rhizophora mangle
Grewia crenata
50

Figure 13. Continued.

241 comparison with other portions of Tongatapu, however, this
311 area has a relatively uniform secondary regrowth dominated
137 by *Panicum maximum* (*saafa*) and other grasses and relatively
125 few important tree species. For Tongatapu as a whole,
128 because of the diversity of plant species and associations,
241 as well as their rapidly changing nature, it was decided to
311 conduct an exhaustive random sampling survey of the bush
137 allotments as described in Chapter I and Appendix A.[A]
Consequently, the quantitative data presented are based on
the survey of 101 or 1.8 percent of the approximately
5,652 bush allotments on Tongatapu. The sampled allotments
had a combined area of 806 acres (326 hectares), 1.8 percent of the 45,214 acres (18,298 hectares) of bush allotments on Tongatapu. From the total of 101 sample bush
128 (line above)
241 allotments, 29 allotments were mapped to give the reader a
311 feeling for the diversity of agricultural landscapes
137 (Table 28 and Figures 14-42). In an effort to subjectively
[126] evaluate distributional patterns of vegetation types or
128 other related agricultural phenomena, the presence or
absence of each item in the survey was plotted on maps of
Tongatapu. An example of these maps is shown in Figure 43.

Extent of Cultivation

311 In the sample of 101 bush allotments, approximately
241 275 acres (111 hectares) or 34 percent of the total area
was cultivated. This amounted to an average cultivated area
of 2.7 acres (1.1 hectares) per allotment. However, of the

[A] [See Category 125, pp. 10-15, 350-358--Analyst.]

[TEXT CONTINUED ON PAGE ~~233~~] 198

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245

Table 28. Key to important tree species for maps of sample bush allotments (Figures 14-42). Allotment numbers refer to sample numbers used during the survey.

Symbol	Scientific Name	English Name	Tongan Name
Aa	*Artocarpus altilis*	breadfruit	*mei*
Am	*Aleurites moluccana*	candlenut	*tuitui*
Amu	*Annona muricata*	soursop	*'apele 'Initia*
Ap	*Adenanthera pavonina*	bead tree	*lopa*
Az	*Alphitonia zizyphoides*		*toi*
Ba	*Barringtonia asiatica*	poison fish tree	*futu*
Bc	*Bruguiera conjugata*	mangrove	*tongo*
Bj	*Bischofia javanica*		*koka*
Br	*Burkella richii*		*kau*
C	*Citrus medica*	citron	*kola*
Ci	*Calophyllum inophyllum*		*feta'u*
Cl	*Citrus limon*	lemon	*lemani*
Cm	*Citrus maxima*	pomelo	*moli Tonga*
Cma	*Cerbera manghas*		*toto*
Co	*Cananga odorata*	perfume tree	*mohokoi*
Cod	*Cedrela odorata*	silky oak	*sita Palangi*
Cp	*Ceiba pentandra*	kapok	*vavae*
Cr	*Citrus reticulata*	mandarin	*molipeli*
Cs	*Citrus sinensis*	orange	*moli kai*
Df	*Diospyros ferrea*		*kanume*
Dfo	*Dysoxylon forsteri*		*mo'ota*

Table 28. Continued.

102
241
311
137
245

Symbol	Scientific Name	English Name	Tongan Name
Dl	Diospyros laterifolia		mapa
Ea	Excoecaria agallocha		feta'anu
Ef	Ellatostachys falcata		ngatata
Eo	Ervatamia orientalis		te'ete'emanu
Et	Elaeocarpus tonganus		ma'ama'alava
Ev	Erythrina variegata	coral tree	ngatae
Fb	Fagraea berteriana		pua Tonga
Fo	Ficus obliqua		'ovava
Fs	Ficus scabra		masi'ata
Ga	Gyrocarpus americanus		puko
Gc	Grewia crenata		fo'ui
Gf	Garunga floribunda		manaui
Gr	Glochidion ramiflorum		malolo, masikoka
Gro	Grevillea robusta	silky oak	'oke
Gs	Garcinia sessilis		heilala
Hl	Heritiera littoralis		ifi tahi
Hn	Homolanthus nutans		malamala'afonua
Ho	Hernandia ovigera		fotulona
Ht	Hibiscus tiliaceus	hibiscus	kaute
Ie	Inocarpus edulis	Tahitian chestnut	ifi
Jc	Jatropha curcas	physic nut	fiki
Ll	Lumnitzera littorea		hangale

Table 28. Continued

102
241
●311
137
245

Symbol	**Scientific Name**	**English Name**	**Tongan Name**
Ma	*Melia azedarach*		*sita*
Mc	*Morinda citrifolia*		*nonu*
Mh	*Macaranga harveyana*		*loupata*
Mhy	*Myristica hypargyraea*	nutmeg	*kotone*
Mi	*Mangifera indica*	mango	*mango*
Mm	*Mertya macrophylla*		*kulukulu*
Oo	*Ochrosia oppositifolia*		*fao*
Pa	*Persea americana*	avocado	'*avoka*
Pac	*Plumeria acuminata*	frangipani	*kalosipani*
Par	*Pittosporum arborescens*		*masi'aukava*
Pg	*Psidium guajava*	guava	*kuava*
Pgl	*Parinarium glaberrimum*		*pipi, pipi failolo*
Pp	*Pometia pinnata*		*tava*
Pps	*Prunus persica*	peach	*piisi*
Pt	*Pandanus tectorius*	screw pine	*fa*
Rm	*Rhizophora mangle* or *R. mucronata*	mangrove	*tongo, tongolei*
Rt	*Rhus taitensis*		*tavahi*
Scl	*Syzygium clusiaefolium*		*fekika vao*
Sc	*Syzygium corynocarpium*		*hehea*

Table 28. Continued

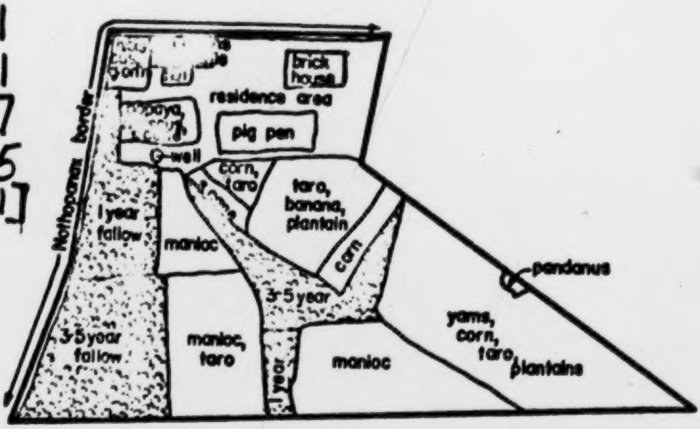
102
241
311
137
245

Symbol	Scientific Name	English Name	Tongan Name
Sd	*Spondias dulcis*		*vi*
Sj	*Syzygium jambos*	rose apple	*fekika Palangi*
Sm	*Syzygium malaccense*	malay apple	*fekika kai*
Sy	*Santalum yasi*	sandlewood	*ahi*
Ta	*Tournefortia argentea*	beach heliotrope	*touhuni*
Tc	*Terminalia catappa*	Indian almond	*telie*
Ts	*Tarenna sumbucina*		*manonu*
Va	*Vavaea amicorum*		*ahi vao*
Xg	*Xylocarpus granatum*	cannonball tree	*lekileki*

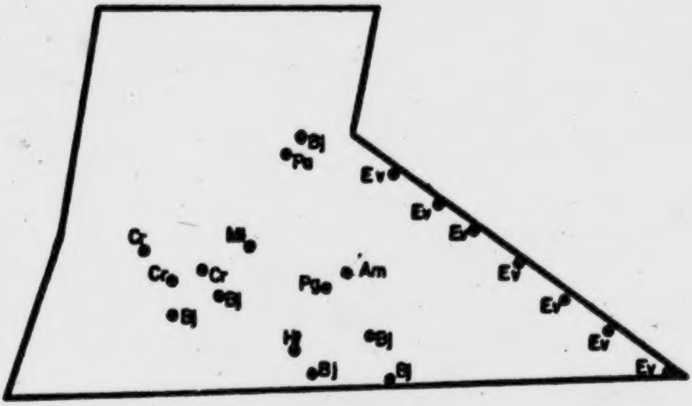
Figure 14. SAMPLE BUSH ALLOTMENT NO. 2

Location: Hofoa Area: 8.25 Acres

102
241
● 311
137
245
[351]


corn
brick house
residence area
papaya
pig pen
well
corn, taro
taro, banana, plantain
Nothopanax border
1 year fallow
manioc
corn
pandanus
3-5 year
3-5 year fallow
manioc, taro
year
manioc
yams, corn, taro, plantains

Distribution of Major Crops


Bj
Pa
Ev
Ev
Ev
Cr
Mi
Am
Cr
Cr
Pg
Ev
Bj
Ev
Bj
Ev
Hi
Bj
Bj
Bj
Ev

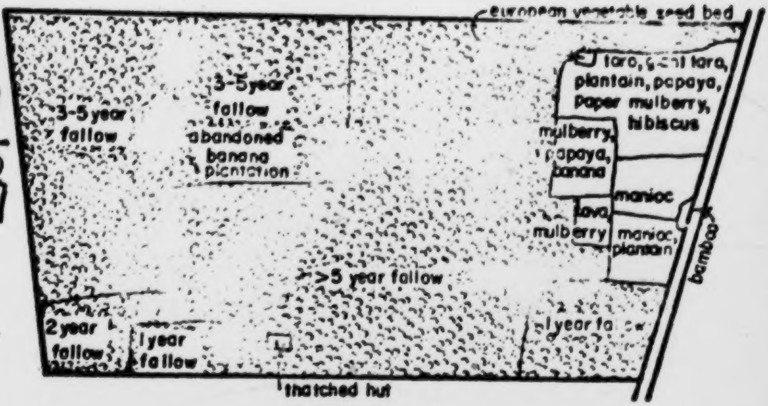
Distribution of Important Tree Species

(Coconut Coverage: 75% Mature Palms; No Replanted Palms.)

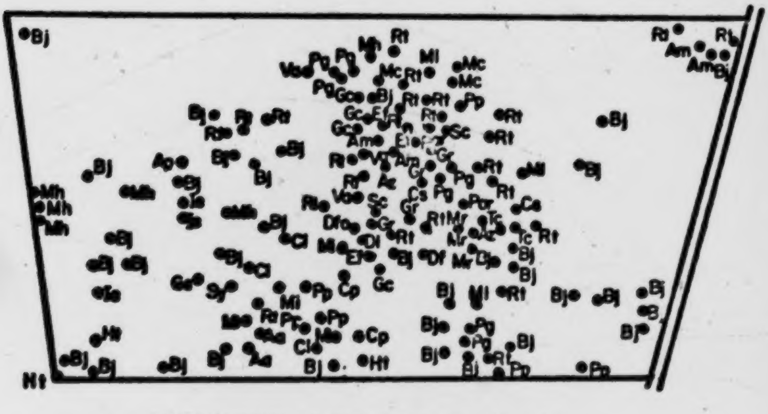
102
241
● 311
137
245
[351]

Figure 15. SAMPLE BUSH ALLOTMENT NO. 3

Location: Hofoa Area: 8.26 Acres


european vegetable seed bed
taro, giant taro, plantain, papaya, Paper mulberry, hibiscus
3-5 year fallow
3-5 year fallow abandoned banana plantation
mulberry, papaya, banana
manioc
kava
mulberry
manioc, plantain
bamboo
>5 year fallow
2 year fallow
1 year fallow
1 year fallow
thatched hut

Distribution of Major Crops


Bj
Rt
Mh
Ml
Mc
Pp
Vae
Pa
Gce
Bj
Rt
Mh
Ap
Cl
Sy
Ge
Ht
Cp
Gc
Cs
Pg
Mr
Tc
Df
Ef
Ac
Am
Sc
Nt

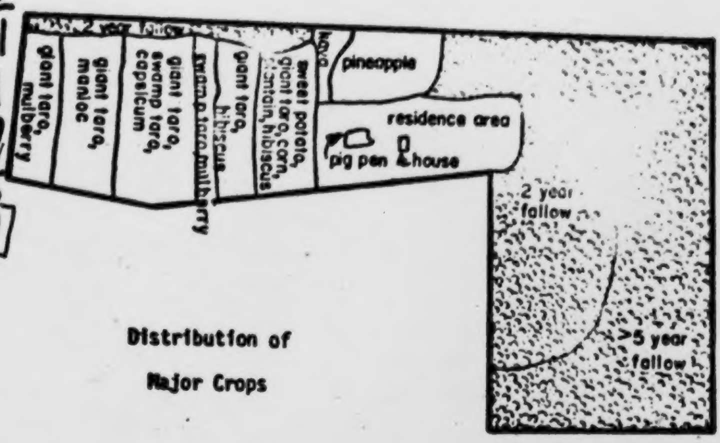
Distribution of Important Tree Species

(Coconut Coverage: 75% Mature Palms; No Replanted Palms.)

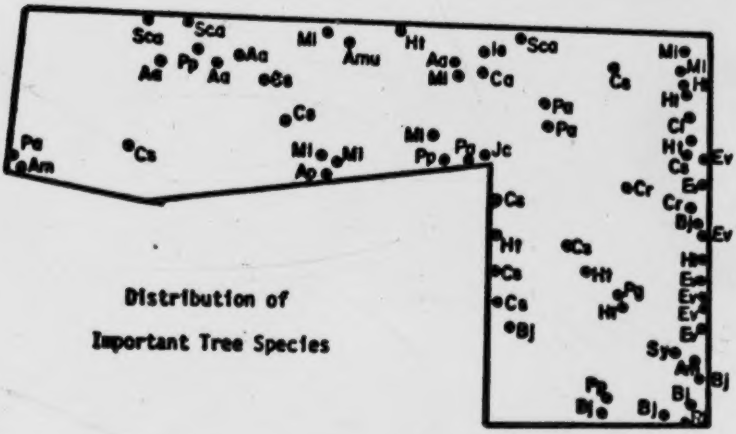
Figure 16. SAMPLE BUSH ALLOTMENT NO. 6

Location: Haveluloto **Area:** 6.41 Acres

102
241
311
137
245
[351]


2 year fallow
giant taro, mulberry
giant taro, manioc
giant taro, swamp taro, capsicum
swamp taro, mulberry
giant taro, hibiscus
sweet potato, giant taro, corn, plantain, hibiscus
kava
pineapple
residence area
pig pen
house
2 year fallow
>5 year fallow

Distribution of
Major Crops


Sca
Sca
Am
Pp
Aa
Aa
Cs
Ml
Amu
Ht
Aa
Ml
Ie
Ca
Sca
Cs
Ml
Ml
Ht
Cs
Pa
Pa
Pa
Am
Cs
Ml
Ml
Ap
Ml
Pp
Pg
Jc
Ht
Cf
Ht
Cs
Ev
Cr
Cr
Bj
Ev
Cs
Ht
Cs
Cs
Ht
Pg
Ht
Bj
Ht
Ev
Ev
Ev
Ev
Sye
Ar
Bj
Bj
Pg
Bj
Bj

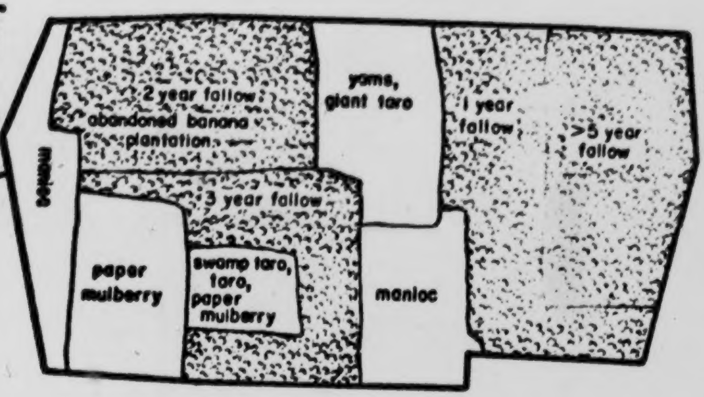
Distribution of
Important Tree Species

(Coconut Coverage: 50% Mature Palms; No Replanted Palms.)

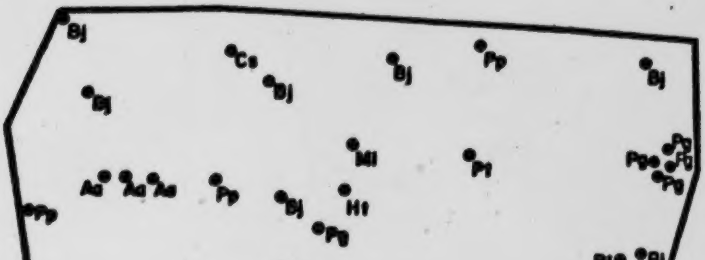
Figure 17. SAMPLE BUSH ALLOTMENT NO. 10

Location: Ma'ufanga Area: 8.36 Acres

102
241
311
137
245


2 year fallow
abandoned banana plantation
yams, giant taro
1 year fallow
>5 year fallow
manioc
3 year fallow
paper mulberry
swamp taro, taro, paper mulberry
manioc

Distribution of Major Crops'


Bj
Cs
Bj
Bj
Pp
Bj
Bj
Mi
Pi
Pg
Pge
Pg
Pg
Aa
Aa
Aa
Pp
Bj
Ht
Pp
Pg
Bj
Bj
Aa
Aa
Aa
Ri
Mi
Bj
Bj
Bj
Bj

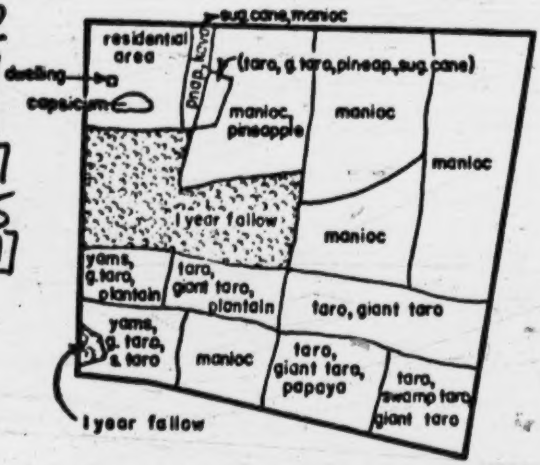
Distribution of Important Tree Species

(Coconut Coverage: 50% Mature Palms; No Replanted Palms.)

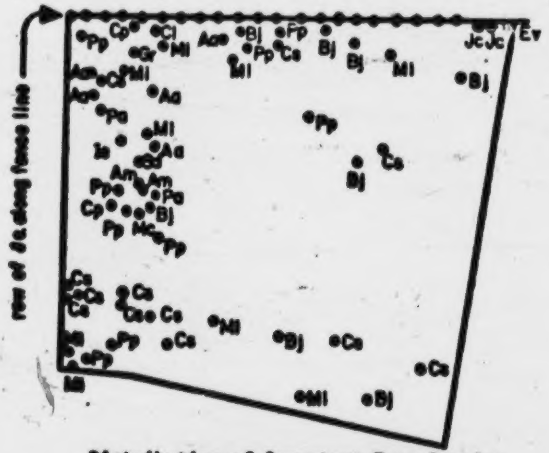
Figure 18. SAMPLE BUSH ALLOTMENT NO. 12

Location: Hofoa Area: 4.76 Acres

102
241
● 311
137
245
[351]


sug.cane,manioc
residential area
pnap. kava
(taro, g.taro, pineap, sug.cane)
dwelling
capsicum
manioc, pineapple
manioc
manioc
1 year fallow
manioc
yams, g.taro, plantain
taro, giant taro, plantain
taro, giant taro
yams, g. taro, s. taro
manioc
taro, giant taro, papaya
taro, swamp taro, giant taro
1 year fallow

Distribution of Major Crops

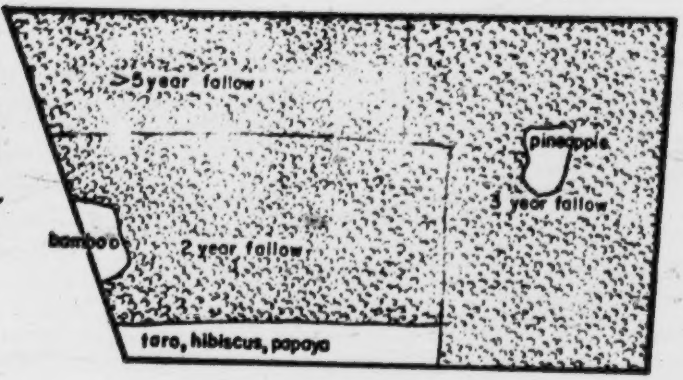

row of Jc along fence line
Pp
Cp
Ci
Gr
Ml
Aa
Bj
Fp
Cs
Jc
Ev
Am
Pa
Is
Nc
Ml

Distribution of Important Tree Species
(Coconut Coverage: 75% Mature Palms; 10% Replanted Palms.)

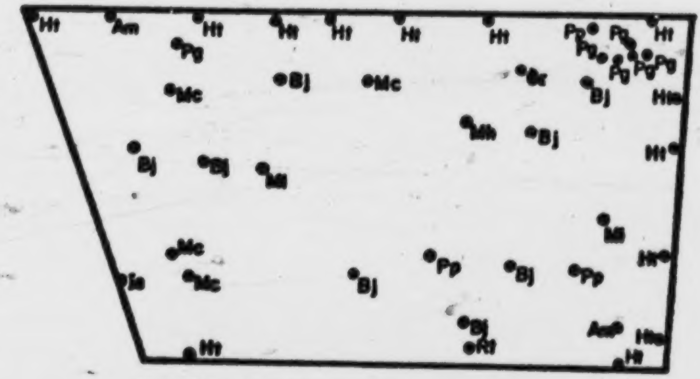
Figure 19. SAMPLE BUSH ALLOTMENT NO. 15

Location: Liahona Area: 8.25 Acres

102
241
● 311
137
245


>5year fallow
pineapple
3 year fallow
bamboo
2 year fallow
taro, hibiscus, papaya

Distribution of Major Crops


Ht
Am
Ht
Ht
Ht
Ht
Ht
Pp
Pg
Ht
Pg
Pg
Pg
Pg
Pg
Bj
Mc
Mc
Bk
Bj
Hm
Mh
Bj
Ht
Bj
Bj
Mi
Mi
Mc
Pp
Bj
Pp
Ht
Ja
Mc
Bj
Bj
Rt
Ht
Am
Hm
Ht

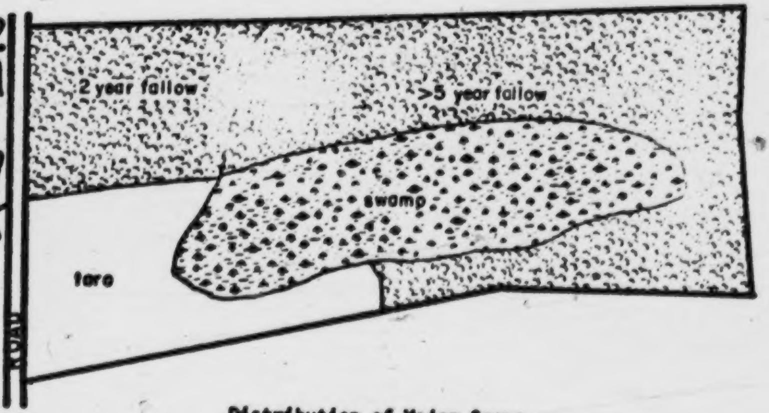
Distribution of Important Tree Species

(Coconut Coverage: 50% Mature Palms; 5% Replanted Palms.)

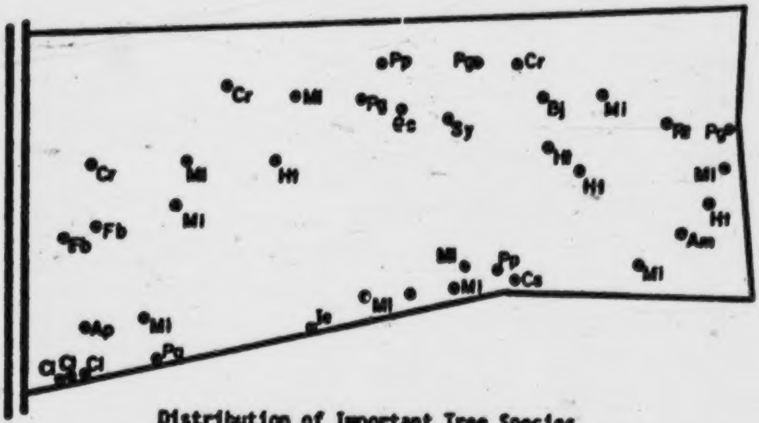
Figure 20. SAMPLE BUSH ALLOTMENT NO. 19

Location: Fatai Area: 8.27 Acres

102
241
●311
137
245


2 year fallow
>5 year fallow
swamp
taro
ROAD

Distribution of Major Crops


Pp
Pg
Cr
Cr
Mi
Pg
Cs
Sy
Bj
Mi
Ht
Pg
Cr
Mi
Ht
Ht
Ht
Mi
Mi
Ht
Fb
Fb
Am
Mi
Pp
Cs
Mi
Mi
Mi
Ap
Mi
Ie
Pg
Ci
Ci
Ci

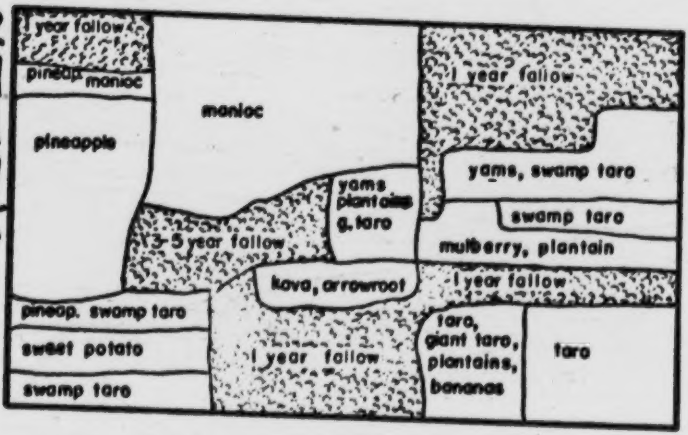
Distribution of Important Tree Species

(Coconut Coverage: No Coconuts.)

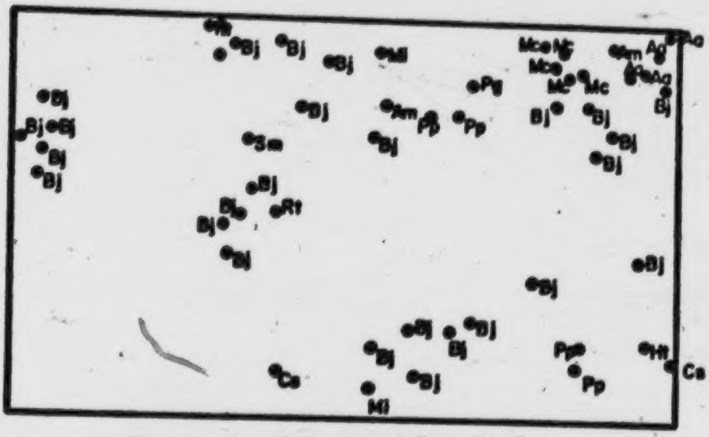
Figure 21. SAMPLE BUSH ALLOTMENT NO. 21

Location: Lakepa Area: 8.25 Acres

102
241
311
137
245


I year fallow
pineap. manioc
pineapple
manioc
I year fallow
yams, swamp taro
swamp taro
yams
plantains
g. taro
3-5 year fallow
mulberry, plantain
kava, arrowroot
I year fallow
pineap. swamp taro
sweet potato
swamp taro
I year fallow
taro,
giant taro,
plantains,
bananas
taro

Distribution of Major Crops

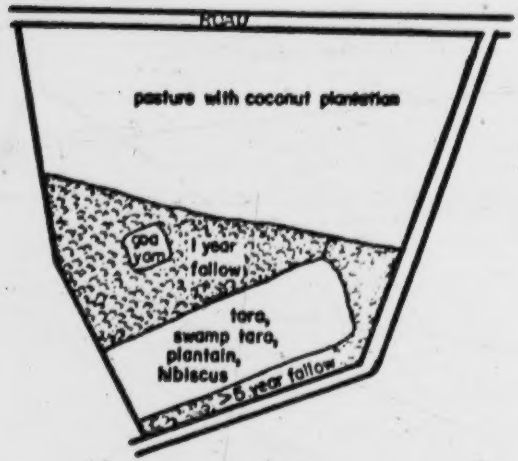

Bj
Bj
Bj
Ml
Mc
Mc
Ag
Ag
Bj
Pg
Bj
Pp
Pp
Bj
Bj
Bj
Bj
Bj
Bj
Bj
Bj
Bj
Sm
Bj
Bj
Rt
Bj
Bj
Bj
Bj
Bj
Bj
Bj
Bj
Pp
Ht
Cs
Cs
Bj
Bj
Pp
Ml

Distribution if Important Tree Species
(Coconut Coverage: 25% Mature Palms; 75% Replanted Palms.)

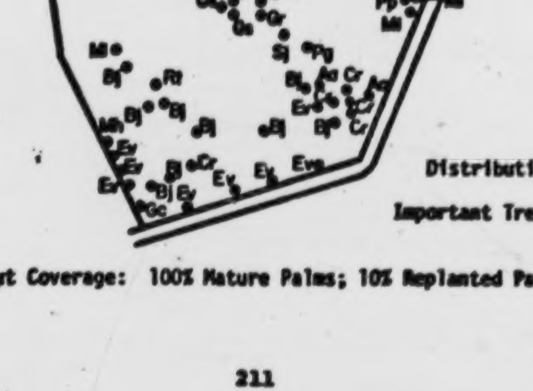
Figure 22. SAMPLE BUSH ALLOTMENT NO. 27

Location: Fe'ui Area: 5.01 Acres

102
241
● 311
137
245


ROAD
pasture with coconut plantation
goa yam
1 year fallow
taro, swamp taro, plantain, hibiscus
>6 year fallow

Distribution of Major Crops


Ca
Ca
Mi
Pp
Is
Is
Aa
Io
Aa
Pp
Gs
Sc
Cr
Pp
Mi
Mi
Gs
Gr
Gs
Sj
Pg
Mi
Bj
Rt
Bj
Aa
Cr
Aa
Bj
Bj
Bj
Er
Cr
Mi
Bj
Bj
Bj
Cr
Ev
Ev
Bj
Cr
Ev
Ev
Ev
Er
Bj
Ev
Gc

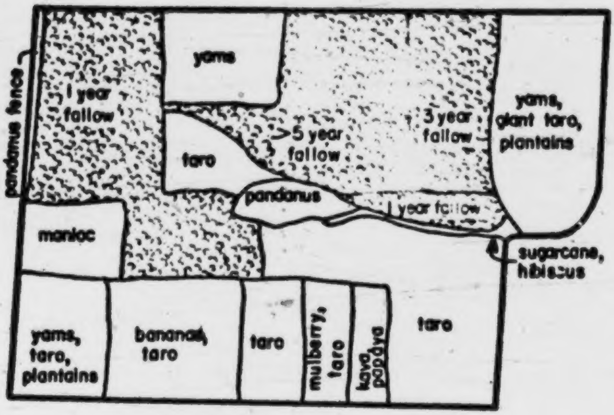
Distribution of Important Tree Species

(Coconut Coverage: 100% Mature Palms; 10% Replanted Palms.)

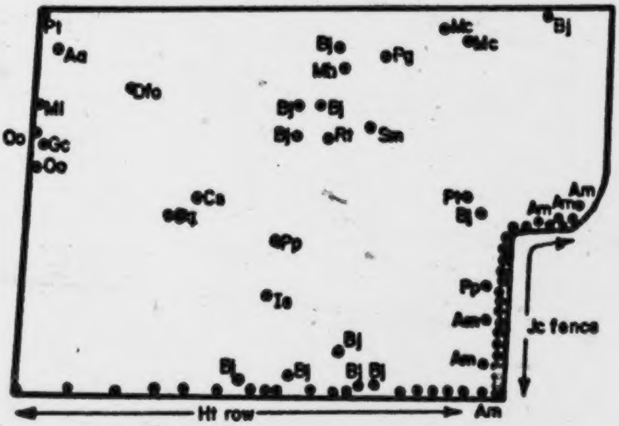
Figure 23. SAMPLE BUSH ALLOTMENT NO. 28

Location: Kolovai Area: 12.00 Acres

102
241
● 311
137
245


yams
1 year fallow
pandanus fence
taro
>5 year fallow
3 year fallow
yams, giant taro, plantains
pandanus
1 year fallow
manioc
sugarcane, hibiscus
yams, taro, plantains
bananas, taro
taro
mulberry, taro
kava, papaya
taro

Distribution of Major Crops

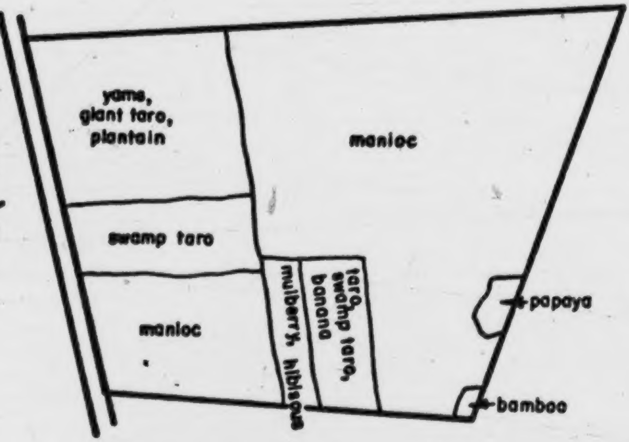

Pt
Aa
Dfo
Ml
Oo
Gc
Oo
Ca
Bq
Pp
Is
Bj
Bj
Bj
Bj
Bj
Mh
Bj
Bj
Bj
Rt
Sm
Pg
Mc
Mc
Bj
Ps
Bj
Am
Am
Am
Pp
Am
Am
Jc fence
Ht row
Am

Distribution of Important Tree Species
(Coconut Coverage: 50% Mature Palms; No Replanted Palms.)

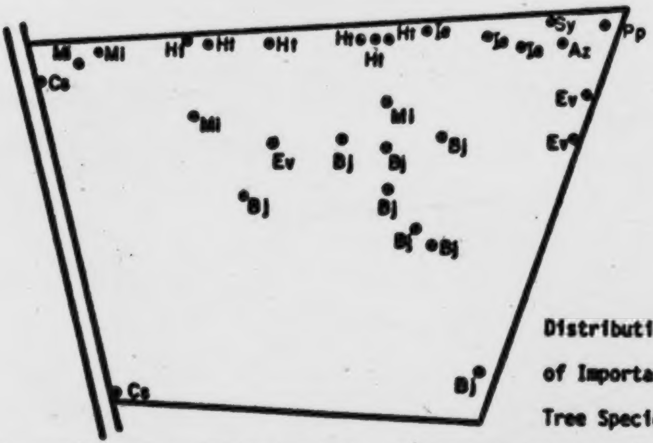
Figure 24. SAMPLE BUSH ALLOTMENT NO. 30

Location: 'Ahau Area: 3.05 Acres

102
241
●311
137
245


yams, giant taro, plantain
manioc
swamp taro
manioc
mulberry, hibiscus
taro, swamp taro, banana
papaya
bamboo

Distribution of Major Crops


Mi
Mi
Ht
Ht
Ht
Ht
Ht
Ht
Ja
Ja
Ja
Sy
Pp
Az
Cs
Mi
Mi
Ev
Bj
Bj
Bj
Ev
Ev
Bj
Bj
Bj
Bj
Bj
Cs

Distribution of Important Tree Species

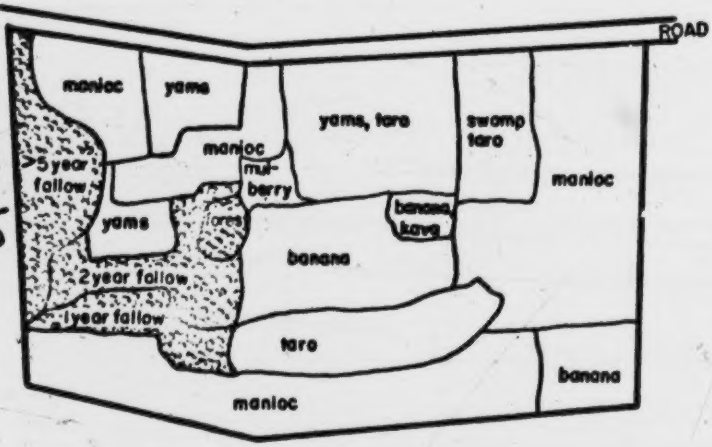
(Coconut Coverage: 25% Mature Palms; 100% Replanted Palms.)

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

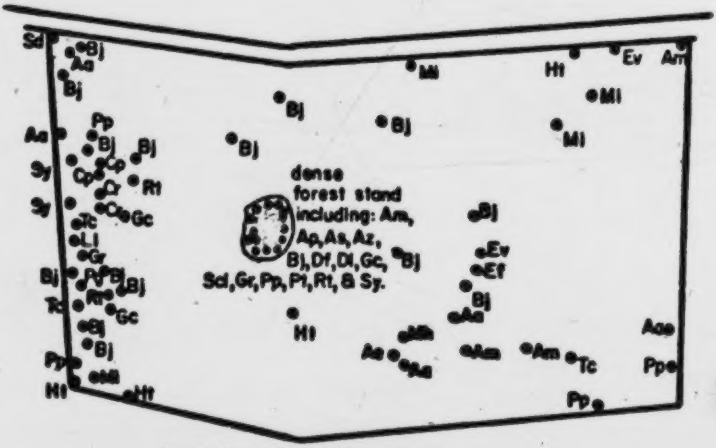
Figure 25. SAMPLE BUSH ALLOTMENT NO. 31

Location: Ha'akili Area: 8.30 Acres

102
241
● 311
137
245


ROAD
manioc
yams
yams, taro
swamp taro
manioc
manioc
mul-berry
>5 year fallow
yams
forest
banana
banana, kava
manioc
2 year fallow
1 year fallow
taro
banana
manioc

Distribution of Major Crops

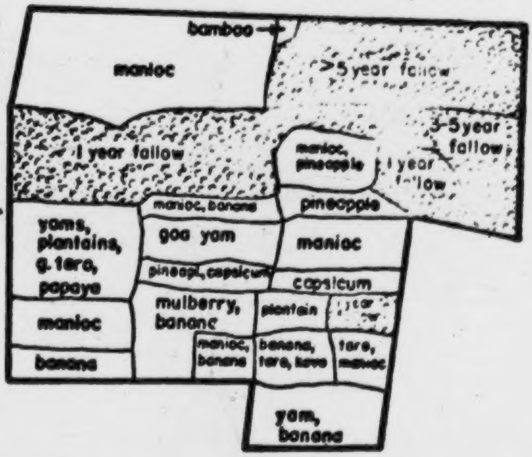

Sd
Bj
Aa
Bj
Mi
Ht
Ev
Am
Mi
Bj
Bj
Mi
Bj
Aa
Pp
Bj
Bj
Sy
Cp
Cp
Cr
Rt
Sy
Cc
Gc
Tc
Li
Gr
Bj
Pv
Pp
Bj
Rt
Tc
Gc
Bj
Bj
Pp
Mi
Ht
Ht
dense forest stand including: Am, Ap, As, Az, Bj, Df, Dl, Gc, Sd, Gr, Pp, Pt, Rt, & Sy.
Bj
Bj
Ev
Ef
Bj
Aa
Ht
Mi
Aa
Aa
Am
Am
Tc
Aa
Pp
Pp

Distribution of Tree Species
(Coconut Coverage: 75% Mature Palms; 75% Replanted Palms.)

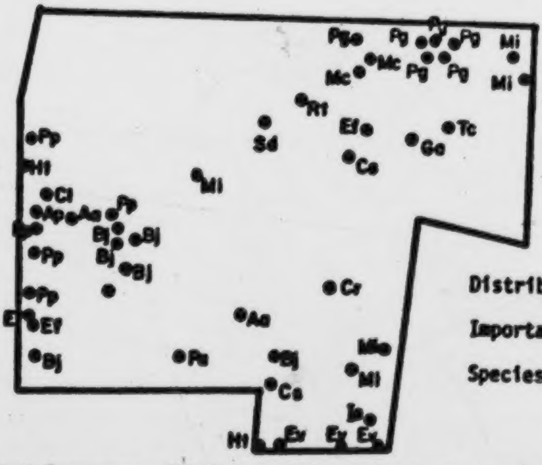
Figure 26. SAMPLE BUSH ALLOTMENT NO. 34

Location: Neiafu Area: 6.22 Acres

102
241
● 311
137
245


bamboo
manioc
>5 year fallow
1 year fallow
manioc, pineapple
3-5 year fallow
1 year fallow
manioc, banana
pineapple
yams, plantains, g. taro, papaya
goa yam
manioc
pineappl, capsicum
capsicum
mulberry, banana
plantain
1 year fallow
manioc
banana
manioc, banana
banana, taro, kava
taro, manioc
yam, banana

Distribution of Major Crops


Pgo
Pg
Pg
Pg
Mi
Mc
Mc
Pg
Pg
Mi
Rt
Sd
Ef
Tc
Go
Ce
Pp
Hi
Mi
Cl
Ap
Ao
Pp
Bj
Bj
Bj
Bj
Pp
Pp
Ef
Cr
Ao
Bj
Ps
Bj
Mo
Mi
Ce
In
Hi
Ex
Ex
Ex

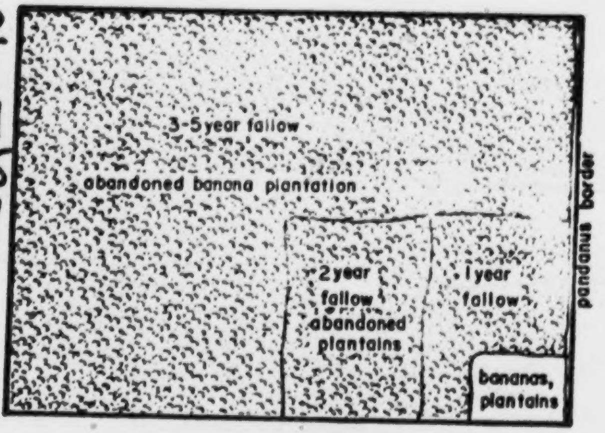
Distribution of Important Tree Species

(Coconut Coverage: 75% Mature Palms; 25% Replanted Palms.)

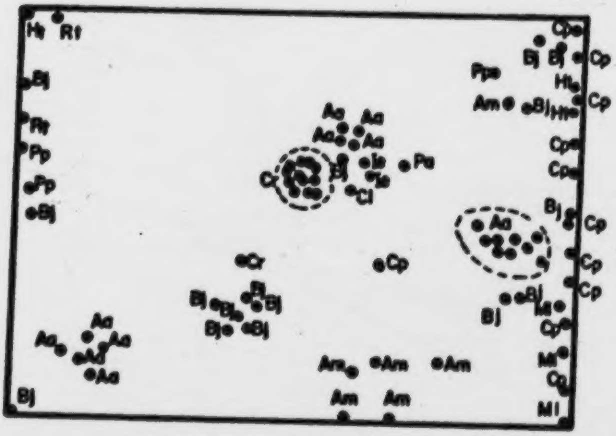
Figure 27. SAMPLE BUSH ALLOTMENT NO. 38

Location: Houma Area: 8.26 Acres

102
311
241
245
137


3-5 year fallow
abandoned banana plantation
2 year fallow abandoned plantains
1 year fallow
bananas, plantains
pandanus border

Distribution of Major Crops


He
Rf
Bj
Rf
Pp
Pp
Bj
Aa
Aa
Aa
Aa
Cr
Bj
Ie
Ie
Pa
Cl
Pp
Am
Bj
Hi
Cp
Bj
Bj
Cp
Hi
Cp
Cp
Cp
Bj
Aa
Cp
Cp
Cp
Cr
Cp
Bj
Bj
Bj
Bj
Bj
Bj
Bj
Mi
Cp
Aa
Aa
Aa
Aa
Aa
Am
Am
Am
Am
Am
Mi
Cp
Bj
Mi

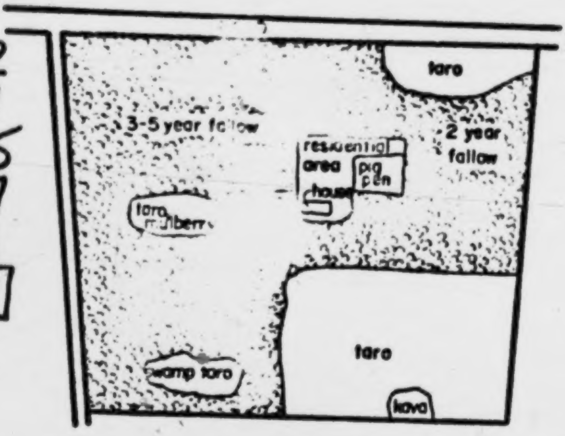
Distribution of Important Tree Species

(Coconut Coverage: 10% Mature Palms; 5% Replanted Palms.)

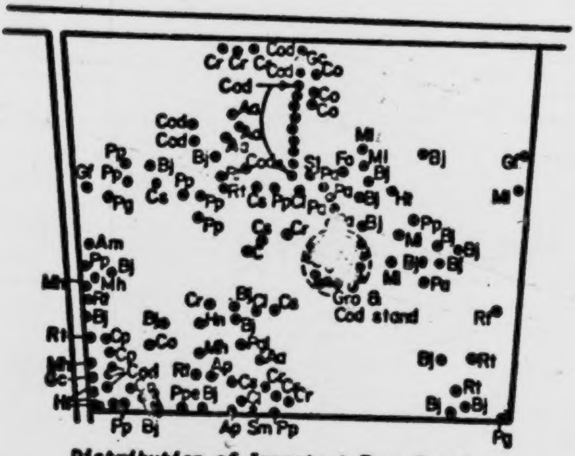
102
241
245
137
● 311
[351]

Figure 28. SAMPLE BUSH ALLOTMENT NO. 39

Location: Houma Area: 8.26 Acres


taro
3-5 year fallow
residential area
pig pen
house
2 year fallow
taro mulberry
swamp taro
taro
kava

Distribution of Major Crops

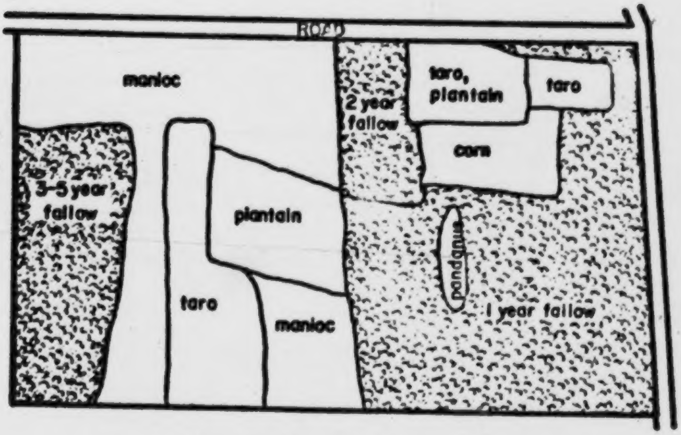

Cod
Co
Cr
Code
Bj
Pp
Gf
Pg
Cs
Ml
Fo
Sl
Ht
Am
Mh
Nh
Rt
Cp
Ap
Sm
Gro & Cod stand

Distribution of Important Tree Species
(Coconut Coverage: 75% Mature Palms; 10% Replanted Palms.)

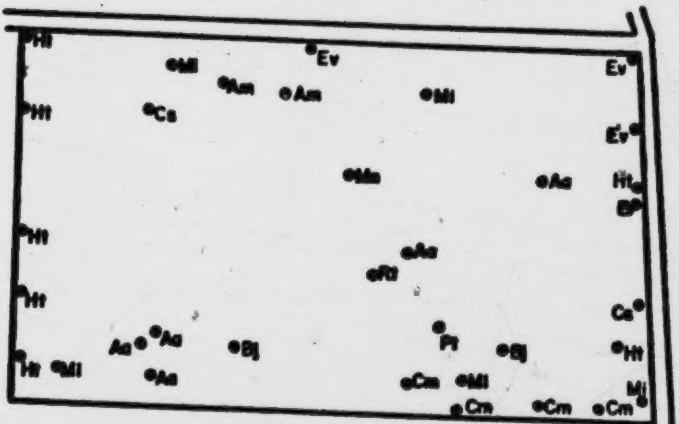
102
241
245
● 311
137

Figure 29. SAMPLE BUSH ALLOTMENT NO. 45

Location: Tokomololo Area: 8.40 Acres


ROAD
manioc
3-5 year fallow
plantain
taro
manioc
2 year fallow
taro, plantain
taro
corn
pandanus
1 year fallow

Distribution of Major Crops


Ht
Mi
Ev
Am
Am
Mi
Ev
Ht
Cs
Ev
Mn
Aa
Ht
Bj
Ht
Aa
Rt
Ht
Cs
Aa
Aa
Bj
Pt
Bj
Ht
Ht
Mi
Aa
Cm
Mi
Mi
Cm
Cm
Cm

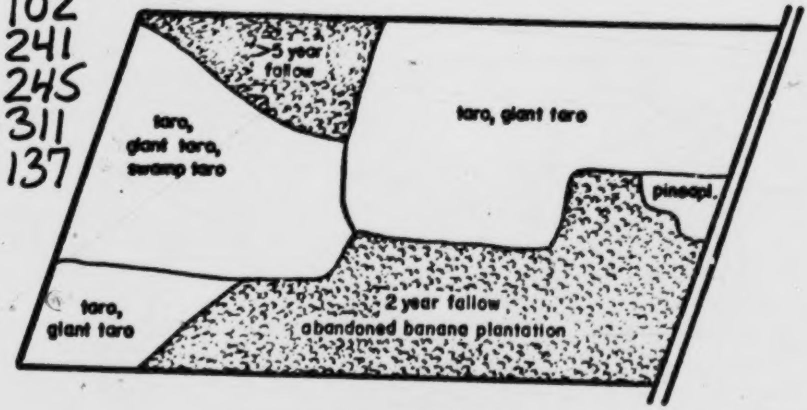
Distribution of Important Tree Species

(Coconut Coverage: 75% Mature Palms; 50% Replanted Palms.)

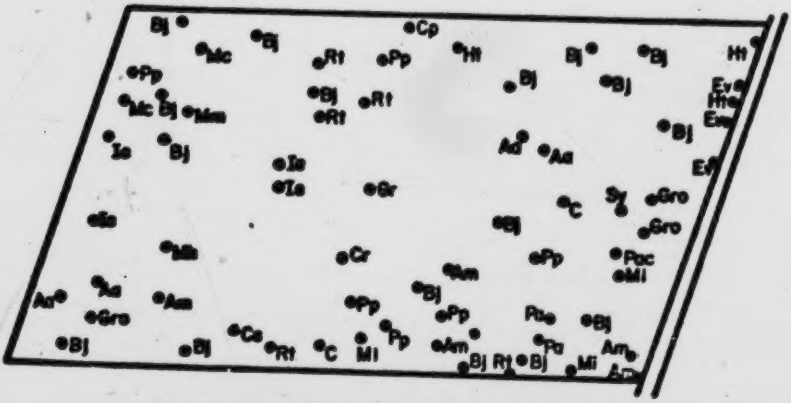
Figure 30. SAMPLE BUSH ALLOTMENT NO. 46

Location: Utulau Area: 8.25 Acres

102
241
245
● 311
137


>5 year fallow
taro, giant taro, swamp taro
taro, giant taro
pineapl.
taro, giant taro
2 year fallow
abandoned banana plantation

Distribution of Major Crops


Bj
Cp
Bj
Mc
Rt
Pp
Ht
Bj
Bj
Ht
Pp
Bj
Bj
Bj
Rt
Mc
Bj
Mm
Rt
Ev
Hte
Ew
Bj
Is
Bj
Is
Aa
Aa
Is
Gr
Ev
C
Sy
Gro
Gro
Bj
Mm
Cr
Pp
Pac
Mi
Am
Aa
Aa
Am
Bj
Pp
Pp
Pa
Bj
Gro
Bj
Bj
Cs
Rt
C
Mi
Pp
Am
Pa
Am
Bj
Rt
Bj
Mi
Am

Distribution of Important Tree Species

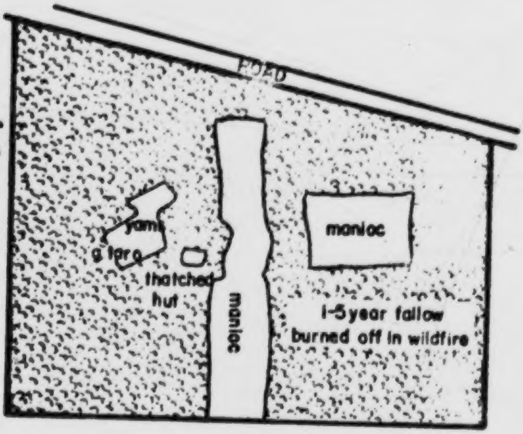
(Coconut Coverage: 75% Mature Palms; 5% Replanted Palms.)

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

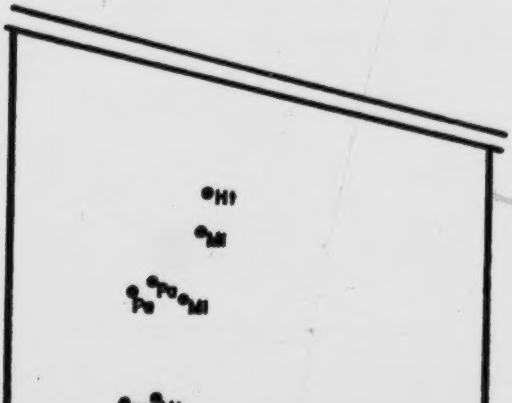
Figure 31. SAMPLE BUSH ALLOTMENT NO. 53

Location: Vaini Area: 8.30 Acres

102
241
245
● 311
137
[351]


ROAD
yams
g taro
thatched hut
manioc
manioc
1-5year fallow burned off in wildfire

Distribution of Major Crops

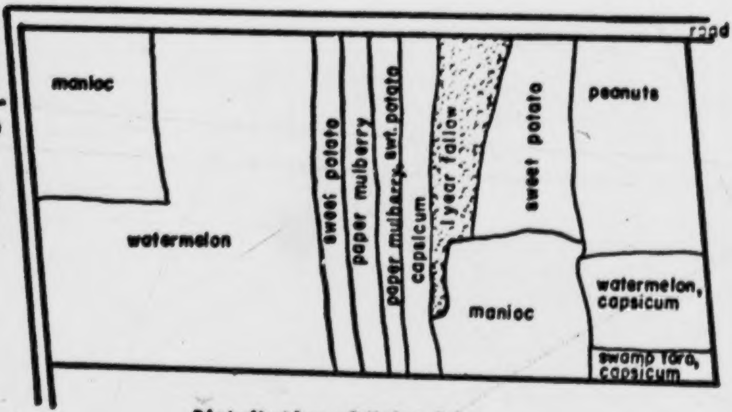

Ht
Mi
Pa
Pe
Mi
Et
Mi
Ht

Distribution of Important Tree Species
(Coconut Coverage: 25% Mature Palms; 10% Replanted Palms.)

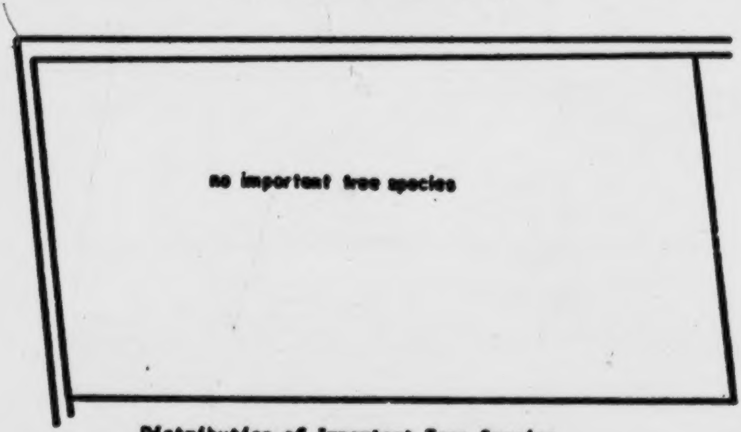
Figure 32. SAMPLE BUSH ALLOTMENT NO. 56

Location: Vaini Area: 8.25 Acres

102
241
245
● 311
137


road
manioc
watermelon
sweet potato
paper mulberry
paper mulberry, swt. potato
capsicum
1 year fallow
sweet potato
peanuts
manioc
watermelon, capsicum
swamp taro, capsicum

Distribution of Major Crops


no important tree species

Distribution of Important Tree Species

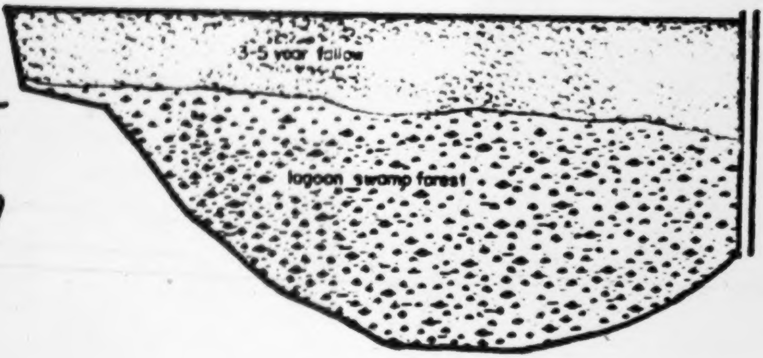
(Coconut Coverage: No Mature Palms; 100% Replanted Palms.)

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

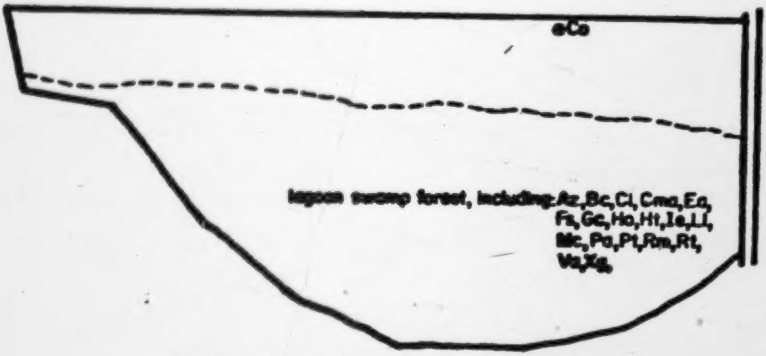
Figure 33. SAMPLE BUSH ALLOTMENT NO. 60

Location: Folaha · Area: 6.28 Acres

102
241
245
● 311
137


3-5 year fallow
lagoon swamp forest

Distribution of Major Crops


eCo
lagoon swamp forest, including:Az,Bc,Cl,Cmo,Eo,
Fs,Gc,Ho,Ht,Ie,Ll,
Mc,Po,Pt,Rm,Rt,
Vo,Xg,

Distribution of Important Tree Species

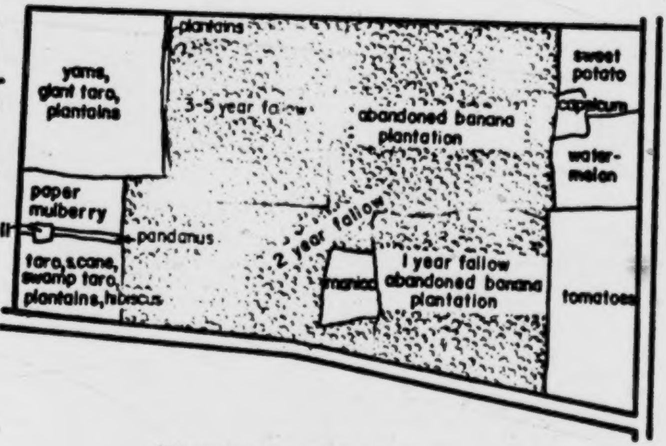
(Coconut Coverage: 100% Mature Palms on Useable Portion of Allotment.)

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

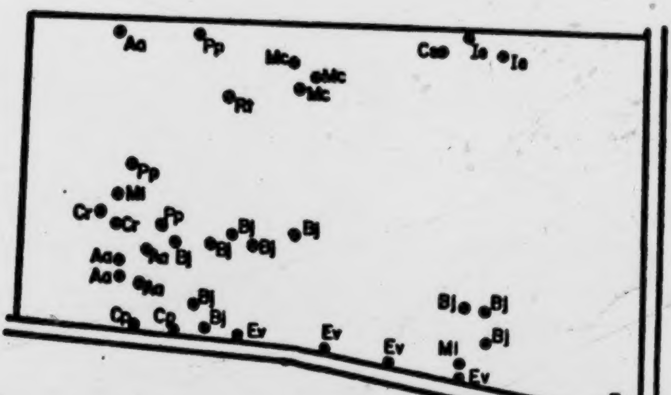
Figure 34. SAMPLE BUSH ALLOTMENT NO. 62

Location: Longoteme Area: 8.25 Acres

102
241
245
311
137


plantains
yams, giant taro, plantains
3-5 year fallow
abandoned banana plantation
sweet potato
capsicum
water-melon
paper mulberry
well
pandanus
2 year fallow
taro, s.cane, swamp taro, plantains, hibiscus
manioc
1 year fallow abandoned banana plantation
tomatoes

Distribution of Major Crops


Aa
Pp
Mc
Mc
Mc
Rr
Ce
Ie
Ie
Pp
Ml
Cr
Cr
Pp
Bj
Bj
Bj
Bj
Bj
Aa
Aa
Aa
Aa
Bj
Bj
Cp
Cp
Ev
Ev
Ev
Bj
Bj
Bj
Ml
Ev
Ev

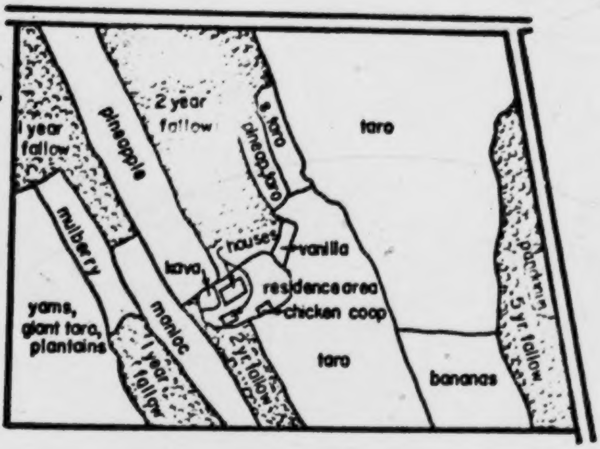
Distribution of Important Tree Species

(Coconut Coverage: 75% Mature Palms; 25% Replanted Palms.)

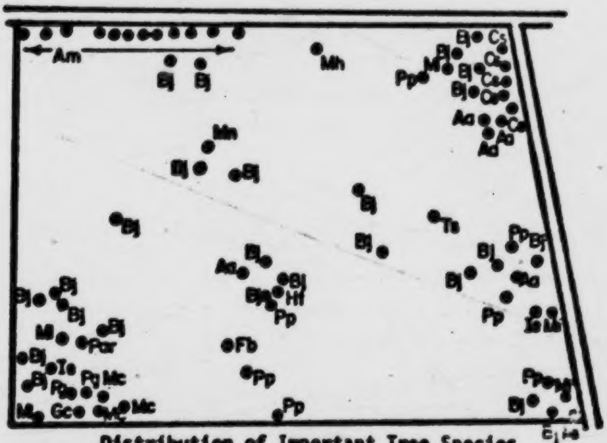
Figure 35. **SAMPLE BUSH ALLOTMENT NO. 67**

Location: Vaini 'uta **Area: 8.25 Acres**

102
241
245
● 311
137
[351]


2 year fallow
1 year fallow
pineapple
taro
pineapple/taro
taro
houses
vanilla
kava
residence area
chicken coop
mulberry
yams, giant taro, plantains
manioc
1 year fallow
2 yr. fallow
taro
bananas
pandanus/5 yr. fallow

Distribution of Major Crops

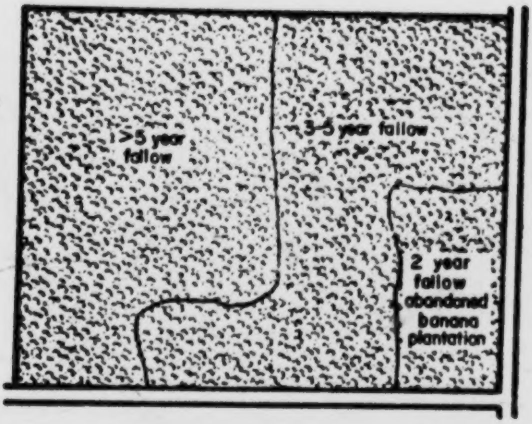

Am
Bj
Bj
Mh
Bj
Cs
Bj
Mi
Pp
Bj
Cs
Bj
Cs
Aa
Cs
Aa
Aa
Mn
Bj
Bj
Bj
Bj
Ts
Bj
Bl
Aa
Bj
Hf
Pp
Bj
Bj
Bj
Pp
Bj
Pp
Aa
Pp
Mi
Par
Bj
Bj
Te
Bj
Mc
Gc
Mc
Fb
Pp
Pp
Bj
Cj

Distribution of Important Tree Species
(Coconut Coverage: 100% Mature Palms; No Replanted Palms.)

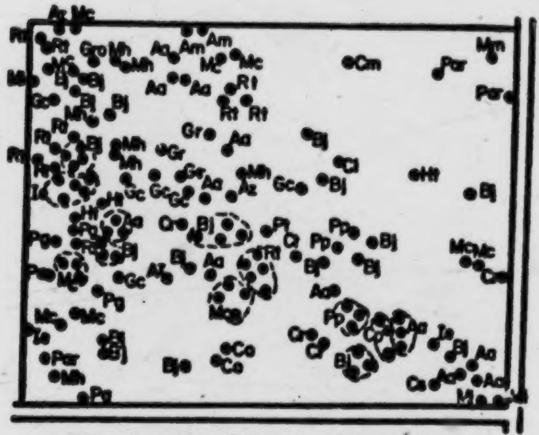
Figure 36. SAMPLE BUSH ALLOTMENT NO. 69

Location: Fua'amotu Area: 8.25 Acres

102
241
245
● 311
137


>5 year fallow
3-5 year fallow
2 year fallow abandoned banana plantation

Distribution of Major Crops

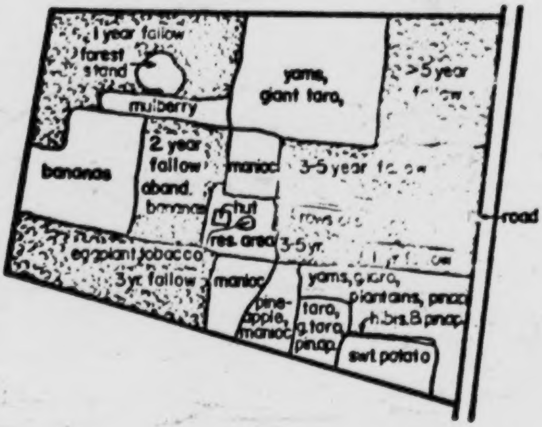

Az
Mc
Rt
Gr
Mh
Aa
Am
Cm
Par
Mn
Bj
Gc
Gr
Cl
Ht
Ie
Pg
Ps
Pp
Cr
Co
Cs
Ma

Distribution of Important Tree Species
(Coconut Coverage: 100% Mature Palms; No Replanted Palms.)

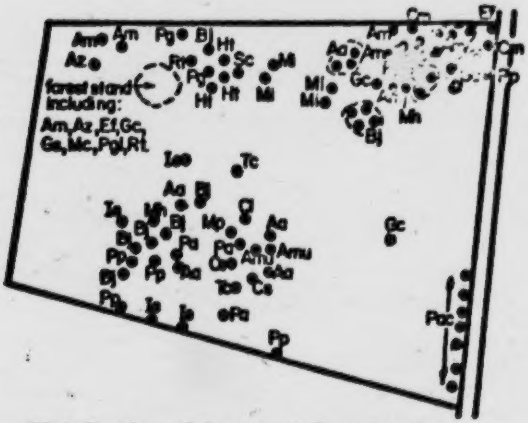
Figure 37. SAMPLE BUSH ALLOTMENT NO. 71

Location: Ha'asini Area: 8.01 Acres

102
241
245
● 311
137
[351]


1 year fallow
forest stand
mulberry
yams, giant taro,
>5 year fallow
bananas
2 year fallow
aband. bananas
manioc
3-5 year fallow
hut
road
res. area
3-5 yr.
eggplant tobacco
3 yr. fallow
manioc
yams, g.taro, plantains, pinap.
pine-apple, manioc
taro, g.taro pinap.
h.bns.& pinap.
swt.potato

Distribution of Major Crops


Cm
Ef
Am
Am
Pg
Bj
Ht
Az
Rr
Sc
Mi
Aa
Am
Cm
forest stand including:
Am,Az,Ef,Gc,
Ga,Mc,Pgl,Rt
Pg
Ht
Ht
Mi
Mi
Mi
Gc
Pp
Mh
Bj
Ia
Tc
Aa
Bj
Ia
Mh
Bj
Bj
Mp
Cl
Aa
Gc
Bj
Pa
Pa
Amu
Amu
Pp
Pp
Oa
Aa
Bj
Tc
Cs
Pg
Ia
Ia
Pa
Pp
Pac

Distribution of Important Tree Species

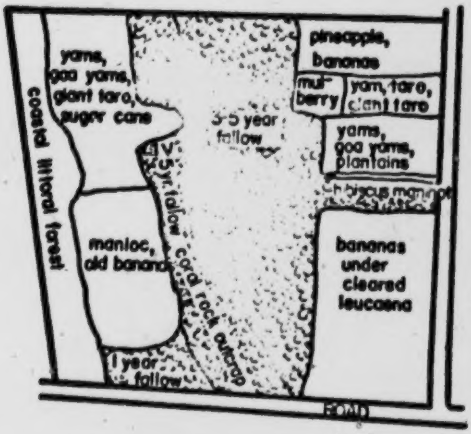
(Coconut Coverage: 10% Mature Palms; 5% Replanted Palms.)

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9
Tongatapu

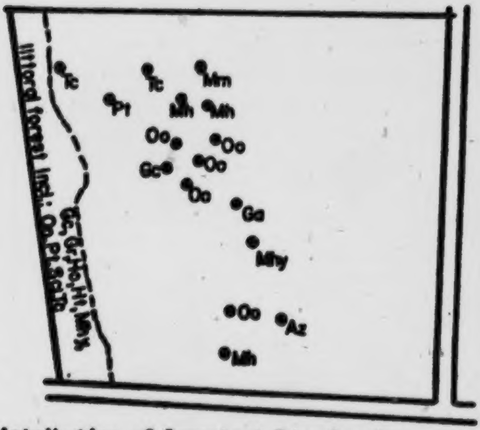
Figure 38. SAMPLE BUSH ALLOTMENT NO. 72

Location:LcLavengatongae Area: 8.10 Acres

102
241
245
● 311
137


coastal littoral forest
yams,
goa yams,
giant taro,
sugar cane
3-5 year
fallow
5 yr fallow
coral rock outcrop
manioc,
old bananas
1 year
fallow
pineapple,
bananas
mul-
berry
yam, taro,
giant taro
yams,
goa yams,
plantains
hibiscus manioc
bananas
under
cleared
leucaena
ROAD

Distributionoof Major Crops


littoral forest incl.: Oo, Pi, Sc, Ib
Gc, Gr, Hc, Ht, Mhy
Tc
Tc
Mm
Pi
Mh
Mh
Oo
Oo
Gc
Oo
Oo
Ga
Mhy
Oo
Az
Mh

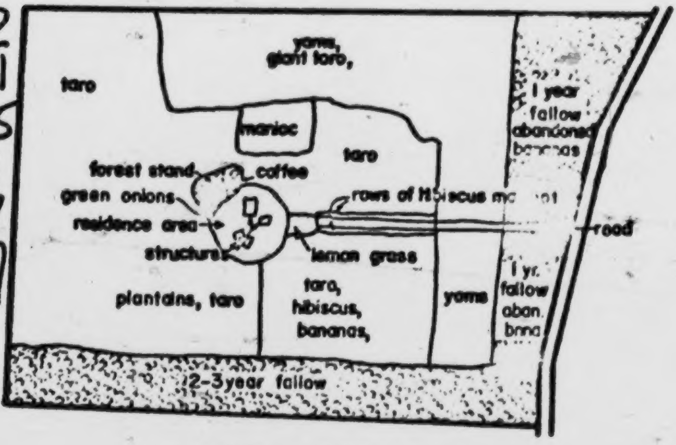
Distribution of Important Tree Species

(Coconut Coverage: 25% Mature Palms; 10% Replanted Palms.)

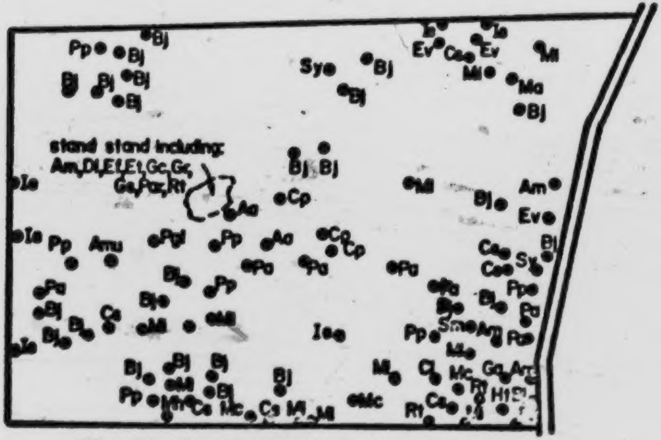
Figure 39. SAMPLE BUSH ALLOTMENT NO. 84

Location: Lapaha **Area:** 10.00 Acres

102
241
245
● 311
137
[351]


yams, giant taro,
taro
manioc
taro
forest stand
coffee
green onions
rows of Hibiscus manihot
residence area
structures
lemon grass
road
1 year fallow abandoned bananas
plantains, taro
taro, hibiscus, bananas,
yams
1 yr. fallow aban. bnna
2-3year fallow

Distribution of Major Crops


Pp
Bj
Sy
Ev
Ce
Ml
Ma
Ie
stand stand including:
Am,Dl,Et,Et,Gc,Gc,
Gs,Pa,Rt
Cp
Ao
Am
Amu
Pa
Cs
Ss
Ppe
Sm
Mc
Cl
Ga
Rt
Hi

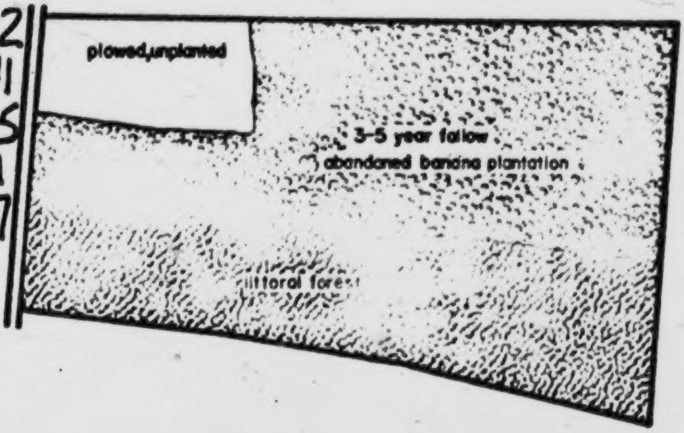
Distribution of Important Tree Species

(Coconut Coverage: 50% Mature Palms; No Replanted Palms.

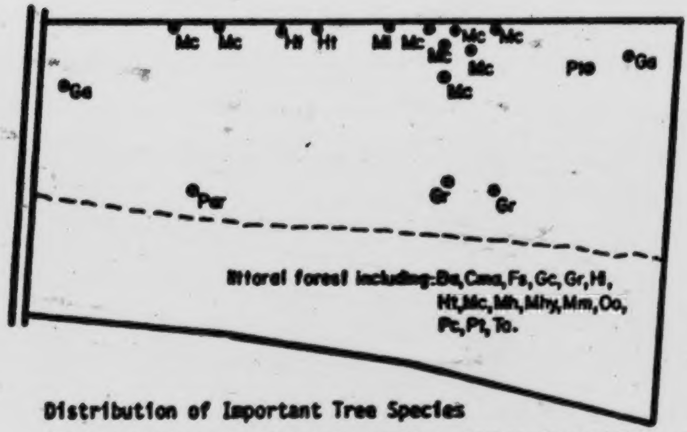
Figure 40. SAMPLE BUSH ALLOTMENT NO. 87

Location: Lapaha 'uta Area: 8.25 Acres

102
241
245
●311
137


plowed,unplanted
3-5 year fallow
abandoned banana plantation
littoral forest

Distribution of Major Crops

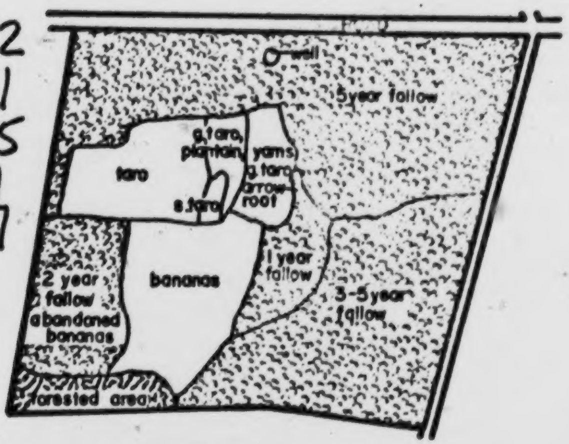

Mc
Mc
Ht
Ht
Mi
Mc
Mc
Mc
Mc
Mc
Mc
Pio
Ga
Ga
Par
Gr
Gr
littoral forest including:Ba,Cma,Fs,Gc,Gr,Hi,
Ht,Mc,Mh,Mhy,Mm,Oo,
Pc,Pt,To.

Distribution of Important Tree Species
(Coconut Coverage: 50% Mature Palms; 50% Replanted Palms on Usable Portion of Allotment.)

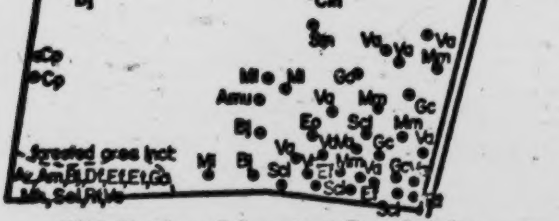
Figure 42. SAMPLE BUSH ALLOTMENT NO. 103

Location: Hoi **Area: 8.26 Acres**

102
241
245
●311
137


road
well
5year fallow
g.taro, plantain
yams
g.taro
arrow-root
taro
s.taro
bananas
2 year fallow
abandoned bananas
1 year fallow
3-5year fallow
forested area

Distribution of Major Crops


Rr
Rt
Bt
Mc
Bj
Mi
Ml
Gr
Et
Eo
Ef
Gc
Am
Pa
Cm
Sm
Va
Mm
Cp
Gd
Amu
Mp
Sci
Vt
Scle
forested area incl
Az,Am,Bj,Dt,Ef,Et,Gc
Mm,Sci,Rt,Vo

Distribution of Important Tree Species
(Coconut Coverage: 10% Mature Palms; No Replanted Palms.)

88: Thaman K-5 (1967-1973) 1978 OU9 Tonga OU9 Tongatapu

102
241
311
128

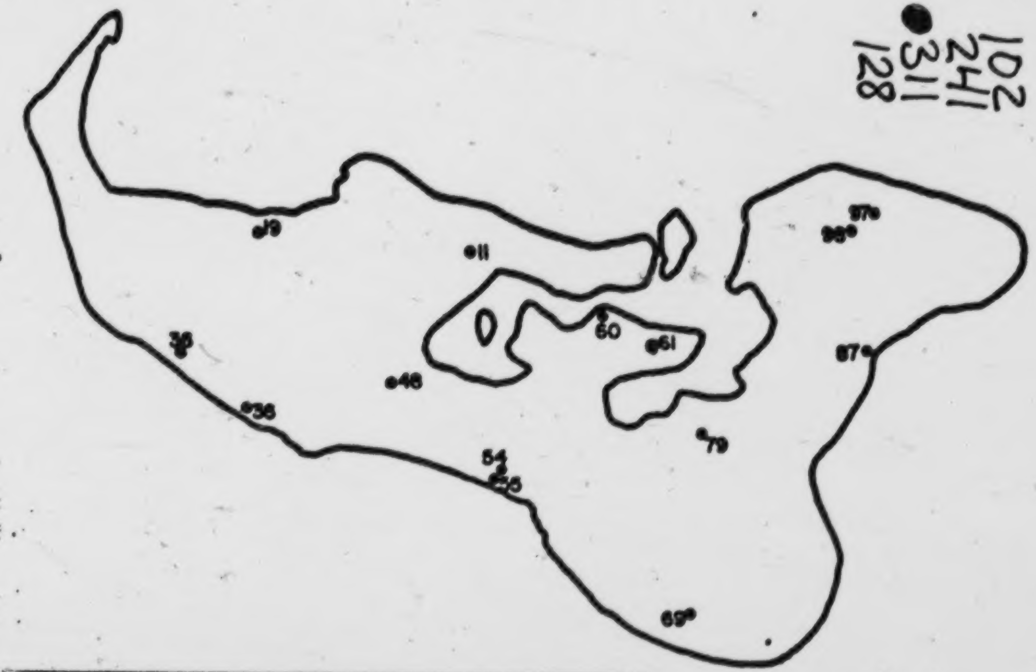


Figure 43. Outline map of Tongatapu showing the locations and sample numbers of of the 14 uncultivated allotments from the sample survey of 101 bush allotments. Such maps were prepared for each item in the survey of bush allotments.

101 allotments, 14 were not cropped at all (Table 29). If only those 87 allotments under cultivation are considered, the average cultivated area becomes 3.2 acres (1.3 hectares) per allotment, an average of 40 percent of the allotment.

Table 29: Frequency of specific percentages of cultivation (subsistence and commercial combined) on 101 sample bush allotments.

% of allotment Cultivated	100.00	93.75	87.50	81.25	75.00	68.75	62.50	56.25	50.00	43.75	37.50	31.25	25.00	18.75	12.50	6.25	0.00	TOTAL
Number of Allotments	0	2	3	2	3	4	7	2	6	7	12	7	7	12	7	6	14	101

On ten allotments, 75 percent or more of the land was cultivated (Table 29); the explanations (of which there were often more than one for a given allotment) obtained from informants or through observation were: in four cases, the allotments were undersized comprising 3.1, 4.8, 4.9, 6.8, acres (1.2, 1.9, 2.0 and 2.8 hectares) respectively;

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in three cases, there was more than one person utilizing the allotment; in two cases, the allotment holder lived on or next to the allotment; two allotments were devoted to commercial production, with the land being plowed on a frequent basis; two holders felt that they were just "energetic" (ivi lahi); and, in one case, the holder belonged to a toungāue of 18 members which worked on his allotment periodically.

On the 14 uncultivated allotments, a number of explanations for the lack of cultivation were also obtained (usually more than one for a given allotment): nine had unprofitable, possibly diseased banana plantations; 8 consisted largely of coastal littoral forest or swamp forest with marginal soils; the holders of six were currently cultivating at least one other allotment; the holders of two lived in Nuku'alofa and held wage-paying jobs; the holders of two were working overseas; the holders of two had died and the widows were not cultivating the land; and one allotment had been burned by wildfire. The uncultivated allotments seem to show slight concentrations along the swampy north coast and the rocky south coast (Figure 43). Similar explanations were given for the underutilization of the 13 allotments where only 12.5 percent and 6.25 percent of the area was cropped. Of these 12 were used only for subsistence cultivation, although nine had abandoned banana plantations.

311 Grazing occurs mainly on hereditary estates or lease-
233 holdings, and out of the sample of 101 bush allotments only
one had any grazing land, approximately 3 acres (1.2
[245] hectares). Like some of the larger plantations, the
[137] allotment was partially fenced, was well planted with
coconut palms and scattered citrus, and other useful trees
with an understory dominated by *Paspalum conjugatum*
(*vailima*), *Elephantopus mollis*, *Psidium guajava* (*kuava*),
Stachytarpheta urticaefolia (*iku'ikuma*), and *Dryopteris*
000 *invisa* (*hulufe*). The practice of setting aside pasture
land will possibly become more common as a result of
initiation of the Cattle Subsidy Scheme in 1971.

241 With respect to cultivated land, it was often
difficult to differentiate between subsistence and commer-
241 cial crops. Bananas, watermelons, pineapples, garden
438 vegetables, and peanuts are grown primarily for export or
439 local sale but are occasionally cultivated for home use.
Conversely, many of the important subsistence crops, such
as yams, taro, plantains, and even manioc are often produced
128 for export and local sale. In order to simplify the
241 already complicated inventory scheme, it was decided to
tabulate as commercial crops all species such as bananas,
watermelons, and pineapples, that are commonly grown
commercially and to tabulate yams, taro, manioc, etc. as
241 subsistence crops. On this basis, of the total acreage
of 101 sample allotments, 30 percent was in subsistence

241 crops, 4 percent in commercial crops, and 1 percent had both intercropped. Of the 87 allotments which were cultivated, all had subsistence crops, whereas only 31 allotments had commercial crops (Table 30).

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● 311

Table 30: Frequency and area of specified types of cropping, pasture, and fallow on 101 sample bush allotments.

Cropping Type	No. of Allotments	Ave. Acreage (Hectares) per Allotment		Total Acreage (Hectares)		% of Total Acreage
Subsistence	87	2.4	(0.9)	233.9	(96.7)	30%
Commercial	31	0.3	(0.1)	29.0	(11.7)	4%
Sub/com.	10	0.1	(<0.1)	7.6	(3.1)	1%
Total. Cult.	87	2.7	(1.1)	275.5	(111.5)	34%
Pasture	1	<0.1	(<0.1)	3.1	(1.3)	0%
Fallow	101	5.2	(2.1)	527.7	(213.6)	65%
Total Sample	101	8.0	(3.2)	806.3	(326.3)	100%

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Major Staple Crops

The frequency of occurrence and estimated acreages of major staple crops as dominants for the 101 sample allotments were obtained from inventories of all crops present and by pacing plots of staple crops (Table 31).

241 actual total acreage of the 101 allotments.

128 Age of Fallow Land

241 Approximately half of all land on the sample allot-
ments had been under fallow for five years or less. A
[311] very low percentage of the sample acreage had been under
fallow for over ten years, mostly uncultivable littoral or
241 swamp forest. Of the non-swamp areas under fallow for ten
137 years or over, only 3 acres had dense forest stands and
the balance had open secondary forests and thickets of
Lantana camara or *Psidium guajava*. Fallow periods are too
short for regeneration of the tropical lowland forest.

Species composition

The survey of the species comprising secondary vegetation attempted to determine both frequency of occurrence and dominance (Table 42).

241 These data are not highly accurate, for two reasons:
137 firstly, most allotments were surveyed only once and the
125 species composition of early pioneer species might vary
128 considerably depending upon either the season or the time
elapsed since a plot had been cleared for cultivation,
weeded,or harvested; and secondly, in the latter stages of
the survey, the author was able to recognize non-dominant
species, which might have been overlooked during the
earlier stages of the survey.

241 Many weedy species were present on at least 75 percent
137 of the sample allotments (Table 42). Some of them, such as

241 438 443 Market. Nuku'alofa, which is probably visited by more than 10 percent of the entire population of Tongatapu on an average Saturday. With the exception of garden vegetables grown by large growers on leasehold land and limited produce from other islands, almost all produce and processed goods come either directly or indirectly, as in the case of handicrafts and folk medicines, from the bush and town allotments on Tongatapu.

241 Bush Allotments

311 Survey results indicated that 34 percent of the area on bush allotments was under cultivation during the 1971 - 72 period. This figure would be somewhat higher if uncultivable rocky and swampy land found on numerous bush allotments is excluded; Hardaker's (1971 : 63) estimate of 36 percent shows close agreement.

241 Of the cultivated land, 87 percent was devoted to subsistence cultivation, 11 percent to commercial cropping, [311] and the balance to a combination of the two. On only one of the 101 sample allotments was there any grazing on 241 244 natural pasture. Of the subsistence acreage, the most widespread crop was manioc (Manihot esculenta) comprising 37 percent of the total acreage. It was followed by American taro (Xanthosoma spp.), 23 percent; yams (Dioscorea alata), 21 percent; and then by swamp taro (Colocasia esculenta) and sweet potatoes (Ipomoea batatas). Other

241 247 318 **There are also a number of species which have been introduced by the government as part of afforestation schemes; these include: Grevillea robusta, Eucalyptus spp., and Cedrela odorata, which have been planted on some allotments.**

241 **On bush allotments the fallow or secondary vegetation has a very important role in the cropping succession.** 241 137 **Approximately two-thirds of the area of bush allotments is under some stage of bush fallow or natural vegetation, ranging in composition from native coastal forests, mangrove swamps, tropical lowland forests, and mature stands of secondary forest, to ephemeral associations of pioneer weed species. About 14 per cent of the sample allotments were completely under various stages of fallow vegetation; in no case was an individual allotment under 100 percent cultivation. There were very few areas under what Boserup (1965:15) classifies as forest fallow: under fallow for** [311] **sufficient time for forest to regenerate. Only 9 percent of the uncultivated acreage was over ten years of age, and a majority of this was actually uncultivable coastal or swamp forest. Another 21 per cent had been under fallow for approximately five to ten years and the remaining 70 percent had been under fallow for less than five years and was characterized by bushes, grasses, ephemeral pioneer species, and few trees.**

In those areas which had been under fallow for over five years, the dominants are usually native tree species,

245 **Increased Coconut Acreage**

654 Owing to the continued efforts of the Coconut Replanting
435 Scheme and the high copra prices in 1974, there should
be a major increase in the acreage of systematically planted
coconut palms in the next five or ten years.

Possible Expansion of Livestock Husbandry

231 Because of government livestock subsidy schemes,
654 there is likely to be an expansion of livestock husbandry
311 and pasture improvement. The expansion of pig and poultry
312 husbandry seem to offer the best prospects because of the
limited land area and water resources on Tongatapu.
000 Accordingly, Hardaker (1971:70) discouraged a widespread
expansion of cattle ownership.

Declining Soil Fertility

134 Owing to the increasing cropping period and associated
241 decrease in thu fallow period, the inherent soil
178 nutrient status and structure of Tongatapu soils have deteriorated
considerably. In almost all cases, today's farmers
feel that farmers of previous generations received much
241 higher yields due to more fertile soils. The relative
134 amounts of nutrients stored in fallow vegetation depend on
the extent to which trees and shrubs have been destroyed,
because grasses and herbs store relatively smaller quantities
of nutrients. As a result, there is less addition of
humus and nutrients to the soil both through litter and
root production and through burning. Furthermore, the

Figure 41. SAMPLE BUSH ALLOTMENT NO. 101

Location: Talafo'ou Area: 8.25 Acres

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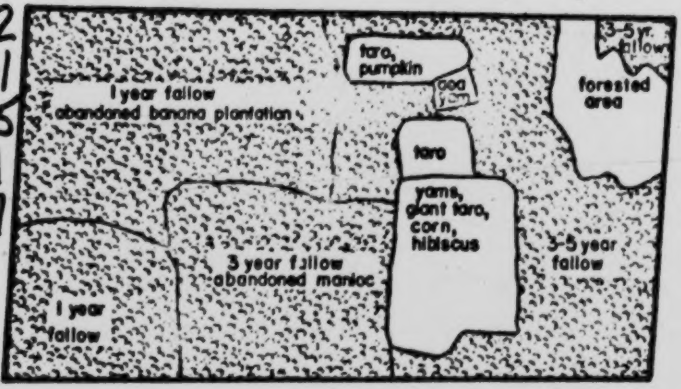
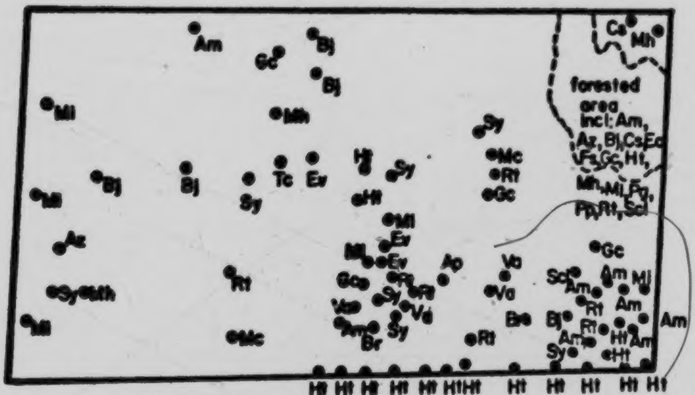

3-5 yr. fallow
taro, pumpkin
forested area
1 year fallow abandoned banana plantation
taro
yams, giant taro, corn, hibiscus
3 year fallow abandoned manioc
3-5 year fallow
1 year fallow

Distribution of Major Crops


Am
Gc
Bj
Bj
Ml
Mh
Cs
Mh
forested area incl: Am, Az, Bj, Cs, Ec, Fs, Gc, Ht, Mh, Mi, Fq, Pp, Rt, Sci
Sy
Mc
Rt
Gc
Bj
Bj
Sy
Tc
Ev
Ht
Sy
Ht
Ml
Az
Ml
Ev
Ev
Rt
Sy
Mh
Ap
Va
Va
Gc
Sci
Am
Am
Ml
Rt
Am
Am
Mc
Rt
Br
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Vd
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Distribution of Important Tree Species
(Coconut Coverage: 10% Mature Palms; 50% Replanted Palms.)

hotels for drunkenness (and for being badly dressed) in order to "protect 457
the image of the Kingdom in the eyes of the tourist." Housebreaking, 273
theft, and unlawful entry are prevalent crimes, and in 1973, for example, 674
there were 427 convictions for theft.

Conclusions

Deep-seated economic problems induced by a growing population have 457
almost engulfed the tiny islands of Tonga. The glitter of tourist money 179
seemingly promises a substantial portion of much-needed economic help,
but would it bring more "troubled times"? The current substantial cruise
business might be considered relatively benign in that visitors are short-
term, and they arrive and depart at a preappointed hour. Comparatively
little capital or space is required to cater to their needs, aside from
docking areas and taxis or busses. Further, the money cruise passengers
spend is largely for local services (transportation, amusement, and for
handicrafts as souvenirs) and directly benefits individuals. The threatened
demise of the cruise industry, to be replaced with an increasing number
of air travelers, may be potentially more disruptive to the economy and to
the culture. To accommodate air visitors, hotels and resort facilities must [311]
be financed and built, and they occupy land—already in short supply,
giving to it by virtue of location a changed economic value. No longer
"bush" or "town," now it is "recreational" land. Given the small size of [527]
Nuku'alofa as well as Tongatapu, one must imagine the impact if one
thousand guests were continually present, day *and* night, demanding that
their needs be catered—including on Sunday when Tongans traditionally
do not work. And although air travel is currently nascent, with a limited
number of annual visitors, the advent of mass travel could "Waikiki" the
beaches, and inundate local culture as has already happened in Hawaii.

The Prime Minister of Tonga (His Majesty's brother) has repeatedly 457
stressed that Tongan culture can withstand the impact of modern tourism 177
development. I, too, am certain that Tongans will survive; however, will 178
they still be Tongans? Or will they become yet another example of a 179
people who have been forced to abandon their traditions (or at least
remove them "back stage" away from prying eyes) to prevent their
becoming the "quaint customs" of ethnic tourism?

The anthropological analysis of economic process [here, tourism] differs from the statistical methods employed by economic planners in that the former assesses the impact upon culture and the social milieu rather than being restricted to balance-of-trade or the CPI. There is an ethnohistoric component to culture change—from then to now—just as there is a cross-cultural component—from there to here—that must be studied. Tongans must become aware of the changes that have occurred

423 427 /118 cont./

325. Within the first year he must, for example, plant 200 coconut palms.

may be dispossessed. In principle, the right to lease the land received is valid for a lifetime, also for the widow of the lessee. After the death of his parents, a son may continue to cultivate his father's land; but no one is supposed to own more than one apai'uta.

427 563 423 Europeans may only rent Tongan land. They are not particularly encouraged in this, since the Tongan government has little interest in the settlement of whites in the Archipelago if they do not seem specially useful for the development of Tonga. However, there are a few European planters in Tonga who have leased their land for periods generally not exceeding 50 years. When the lease period runs out it may be extended at increased rentals; after the lease contract expires, the right of disposal naturally goes back to the Crown.

423 [311] This fundamentally excellent system of land ownership can serve to assure all Tongans an adequate livelihood, since $8^{1}/4$ acres of the relatively fertile land are quite adequate to feed a family well. [622] [634] The supervision of commoners by their chiefs in old times is today continued by the town officers (under the guidance of the district officers) who direct the natives to plant fixed quantities of certain crops. In this way the government wants to achieve an unchanging, assured subsistence for its people. However, most Tongans are independent enough to cultivate their land properly even without these directives, and usually they plant more than is recommended. The government's right to deprive the lessees who do not comply with these instructions is seldom made use of, and only in extreme cases. There are many plantations that are only occasionally visited by their lessees and that seem very neglected, and no one feels it is important to take the owners to task.

/121 cont./

000 involved. Moreover, the Tongan population is growing very much; the
423 dearth of land in the Ha'apai Islands will increase, on the other
[161] inhabited islands land will become scarce after one or two generations.
[311] However, the opening-up of the Archipelago's uninhabited islands, as
well as a few land reclamation projects along the broken-up coasts
(or in the swamps) of the low islands (for example, Tongatapu), and
above all an intensification of agriculture will always be able to
provide relief.

423 Without doubt there is the possibility that a greater difference
184 between rich and poor will develop as a result of the unequal land
578 distribution, and on the small, already overcrowded Ha'apai Islands
social tensions might possibly arise. Today, however, nothing of
this kind can be observed; the Tongans live their relatively peaceful
lives and no one gets excited if he sees his neighbor ending up with
greater profits from his copra work because of his large plantation.

423 European advisers and critics admit that the present system
178 of land ownership is basically good, given the present state of
agriculture. Yet they emphasize that this system is not flexible
enough to make room for possible changes (improvements) in cultivation
and in increased cattle-raising, which is scarcely possible with
8 ¼ acres. Since, for the natives, the present system of planting
[241] suffices and they find it most difficult to adopt new food plants,
[233] and since they show relatively little understanding for cattle-raising
even where there is an opportunity, a change in the system does not,
for these reasons, seem very urgent.

423 /122/ On the whole, it may be said of land distribution that the
177 ancient Tongan system was altered as a result of Europeanization and
the establishment of a Christian, democratic government. However,
423 this change occurred more in form than in kind. The present system
565 of land distribution, which seems somewhat strange to us, means a

241 /150 cont./
178 cultivation probably been made up for since the population has
[161] doubled in comparison with ancient Tongan times, and since it nourishes
itself primarily on home-grown products, the necessity for culti-
241 vation should be considerable. Thus today, for example, the in-
311 habited islands of the Ha'apai group are almost entirely covered with
plantations of the natives, except for the strip of bush land along
the shore (to protect the plantations against storms) covering
approximately ten percent of the land. On the island of Nomuka, for
example, according to the recollection of older natives, there was
a great deal of unused bush land in the old times, whereas today
all productive land is cultivated, however, on Tongatapu, 'Eua and
Vava'u part of the land is still unused.

241 Considerably more work seems to be required of each individual
to cultivate his land than even just a few decades ago. The views of
informants on various islands of the Archipelago indicate that 30 or
40 years ago it was much easier than it is today for the Tongan to
feed his family with what he planted, and several relatives besides.
[134] The reason for this change probably lies particularly in the
exhaustion of the soil on the naturally quite fertile islands, where,
in various places for instance, there is no longer enough land
available to /151/ introduce the necessary periods of fallow, (397)

397. Fertilization is still unknown.

and there is therefore relatively little yield, particularly from
the yam plants. The increased population can, however, still live
well on the products of its planting, (398)

[731] 398. Except for occasional hardship as a
result of drought or storms.

even though there is no longer the surplus of products that G. B.
Forster, for example, reports (on Nomuka). (399)

166 162 maldistribution of resident population, with over 50 percent now
living on Tongatapu. This situation is compounded by the decreas-
241 178 ing use of arable farmland and a subsequent reduction in the produc-
tion of indigenous foodstuffs (Fox 1972, p. 5).

311 Several Tongan geographic features are influential in the
[133] distribution of the Tongan population. The western chain of islands
in the Tongan group are volcanic and therefore have been settled
only intermittently. These islands, usually smaller in size, are
less densely settled than the eastern coral islands. Factors, such
as the lack of permanent fresh water, and land too steep for anything
beyond scattered cultivation, severely limit their settlement poten-
[133] tial. In addition, occasional volcanic eruptions further deter
settlement. During the civil war period of Tongan history, most of
the western chain islands supported sizable populations. However,
only Niuafo'ou and Niuatoputapu continued to support communities
311 into the twentieth century (Walsh 1970, p. 30). A volcanic eruption
166 on Niuafo'ou in 1946 forced its evacuation and most of the village
[133] population from this island resettled on 'Eua. (Niuafo'ou was
resettled in 1958.) Recent attempts to settle Kao and Tofua in
Ha'apai have met with varied success. Only Tofua appears, at
present, able to sustain a reasonable population. However, plans
and proposals are occasionally presented for the permanent settle-
ment of Late and Koa, also in Ha'apai.

161 The concentration of Tongan population within towns and
162 villages is expected to continue to be a significant feature of
166 Tongan population distribution. Similarly, a growth in the number

161 166 162 of village communities with populations in excess of 1,000 is anticipated, particularly on Tongatapu and 'Eua. The attraction of 'Eua appears to be the availability of land, which motivates the 161 162 migration of Tongatapu's landless males. Table 7, which includes the distribution of population from the 1921 census, illustrates the population growth on 'Eua, from 1.4 percent of the total population in 1939 to 4.3 percent in 1966.

311 Another significant factor determining population distribution is proximity to food source. In most cases, this results in [161] location either near the sea or near cultivated land. Maude, in his examination of Tongan areas of low and high density, has

161 162 TABLE 7.--Population Distribution.

District	Population 1921	Population 1939	Population 1956	Population 1966
Tongatapu	10,127	15,754	31,264	47,920
Ha'apai	5,976	7,483	9,918	10,591
Vava'u	5,787	8,199	12,477	13,533
Niuatoputapu	791	836	1,254	1,395
Niuafo'ou	1,108	1,378	---	599
'Eua	---[1]	480	1,925	3,391
Total	23,759	34,130	56,838	77,429

[1] Included in the Tongatapu figures.

SOURCE: S. N. Fiefia, Report of the Results of the 1966 Census (Nuku'alofa: Government Printer, 1968), p. 9.

311 suggested that a balance between land and sea resources is generally
161 the determining factor (Maude 1965, p. 63).

166 Although it is in close proximity to Tongatapu, in-migration to 'Eua has only recently been of significance. Interviews with residents of 'Eua suggested two reasons for this relative neglect. Passage to 'Eua is often dangerous, owing to the reef which surrounds the island. In addition, there is a marked lack of seafood available to the settlers on 'Eua. However, with the lack of land and the increasing population pressure on Tongatapu, coupled with the availability of land on 'Eua, in-migration is expected to steadily increase.

161 Population density, in relation to tillable land, is often
423 determined by the degree of willingness on the part of Tongan
311 nobles, to lease their holdings. In eastern and southeastern
427 Tongatapu, large tracts of land lie idle or are used only minimally.
However, in other portions of the nation, where landowners have been willing to lease, distribution is concentrated and densities are much higher.

311 Table 8 includes population density statistics for the
[161] major districts of the nation. For purposes of discussion, population density can be considered at three levels: (1) uninhabited land, (2) areas of low density, and (3) areas of high density.

Uninhabited areas of the Kingdom are usually those lands which are either unsuitable for cultivation or restricted from cultivation by members of the nobility. The majority of the volcanic formations in the western Tonga chain are included within

101: Clark K-4,5 (1974) 1978 OU9 Tonga OU9

161 TABLE 8.--Population Density of Each Principal District: 1956 and 1966.

162

311

District	1956	1966
Tongatapu	313	480
Ha'apai	490	523
Vava'u	281	304
Niuatoputapu and Tafahi	172	191
'Eua	57	100

SOURCE: S. N. Fiefia, Report of the Results of the 1966 Census (Nuku'alofa: Government Printer, 1968), p. 9.

311 the former category. As mentioned previously, the lack of suitable water sources, coupled with the steep and rocky landscape, pose an effective deterrent to agricultural settlement.

Several important examples of uninhabited coral formations [134] are located within the eastern island chain. Walsh described Uoleva as having never been inhabited and explained that the soil of the island is unsuitable for yam cultivation and "although visited and farmed to some extent, there is no record of permanent settlement" (Walsh 1970, p. 30). Interviews within Ha'apai settlements supported this conclusion in relation to several smaller uninhabited islands of this same island group.

The uninhabited areas of Vava'u are usually small islands which are steep and provide little acreage for productive farming. Also, in Vava'u, which has not experienced significant overcrowding, there has been little need for additional land. Many farmers

311 recognize that the uninhabited land is available, but continue by stating, "We have enough land."

311 161 Although Ha'apai and Vava'u include areas of low density population, the majority of this land is located on Tongatapu, also the scene of in-migration, population maldistribution and crowding. 311 161 423 While totally uninhabited areas on Tongatapu are few, there are several areas of extremely low density, most often held by the nobility and located within the eastern and southeastern districts. 565 The total amount of land held or controlled by Tongan nobility and/or royalty is unpublished (Rogers 1969, p. 217), and estimates vary 000 from less than 50 percent to 70 percent. However, it is anticipated that population pressure, building throughout the Kingdom and particularly on Tongatapu, will necessitate the end of such land hoarding.

311 161 Natural factors may also contribute to the low density of a particular area. Maude's assumption of a balance of "land and sea resources" would seem to be the major cause. Though growing population pressure may necessitate a reordering of this concept, at present it appears that a scarcity of seafood correlates highly with low population density on adjacent land areas. This is particularly noticeable in the smaller islands of Eastern Ha'apai, and in areas [133] of Vava'u. However, the situation in Vava'u is compounded by the inaccessibility of existing resources, owing to reefs and rocky shorelines.

On the other hand, densities which are highest, excluding urban areas, are located within areas where reefs provide an

311 accessible and abundant sea resource. This is true of western
161 Tongatapu and the western sides of the Ha'apai islands, with the
reefs of inner Ha'apai being the most productive.

369 Urban areas are by definition high density zones, and
therefore need not be defended as such. However, urban density
369 can be examined in relation to size of housing units within the
162 islands. The average size of the Tongan household, as reported in
592 1966, included 6.7 persons. Recently collected data indicated no
significant change in this level. However, the census reported
nine villages with households averaging eight persons, and four
villages which averaged over nine persons per household. Most of
these were located on Tongatapu. Similarly, recent study indicated
the average household size in Nuku'alofa to be 7.96; Pangai, 7.55;
and Neiafu, 7.42. In addition, more than 63 percent of those households
containing three or more nuclear family units were located on
Tongatapu.

161 High density rural areas may number more than 2,000 persons
per square mile, as in some parts of Ha'apai, while urban densities
may be much higher. The average density of the population on
inhabited islands, in 1966, was approximately 375 persons per square
mile. This represented an increase in overall density per square
mile of nearly 100 persons, from 1956 to 1966. However, these statistics
are of little significance, unless considered in relation to
the Kingdom's available human, natural, and agricultural resources.
128 The following sections, which treat land tenure and agricultural
exchange, will rely heavily upon an analysis of these resources, and
their critical interrelations within Tonga.

423 This lack of compliance results from inadequate surveying, disputed
565 boundaries, and/or apathy.

423 In addition to the 31.1 percent of total acreage being
643 held by nobility, Crown lands account for another 20.7 percent. This land, much of which is totally unused, includes the holdings of the King and the royal family.

423 Another type of estate, of recent origin, is that desig-
[647] nated as government estates, under the control of the Tongan Ministry of Lands. These consist of land which has not been granted by the Crown to the nobility.

423 Thus, the estate is the primary unit in the division of
land by the Crown. However, beyond the breakdown of land ownership within Table 10, an accurate accounting of land availability
[311] and distribution is difficult. It may be reasonably assumed that
over one-half of the Kingdom's total acreage is held in estate form, with much being left unused or used below capacity. The uneven distribution of population further complicates an analysis of the Tongan estate system. For example, while estates in Vava'u and 'Eua may show a capita per acre ration of 1:5, more densely settled Ha'apai and western Tongatapu show ratios of 1:0.9. This fact leads to an expectation of internal migration, resulting in
423 more favorable distribution patterns. However, landless householders
425 indicate that it is extremely difficult to obtain land in distant
[609] areas. This is in direct conflict with the principles of the 1927
Land Act, and emphasizes the influence of tradition and the unwill-
[565] ingness of nobility to lease land to those from outside their districts.

134 likely owing to the combination of a number of factors, both
241 physical and cultural, not the least of which are rainfall, general
weed and grass growth and the custom of burning acreage prior to
planting.

The key to the maintenance of soil fertility in the islands
under the present pattern of cultivation is the system of "bush
fallowing" and close planting of crops which results in the retention of some humus in the soil (Great Britain Colonial Office
134 1956-64, p. 20). This, along with the soil characteristics described,
make some minor leaching and nitrogen depletion the major problems
regarding the soil's physical properties.

137 Vegetation is luxuriant and includes most typical tropical
types with a number of superimposed imported varieties, particularly food producing plants. In addition to introduced food crops, an undesirable feature of plant life which has been introduced is weeds which pose problems for agriculture as well as being a bother to the human element (Pacific Islands, Vol. III, 1944, p. 37). The most significant of these are the grasses, including Nut, Guinea and Johnson varieties (Jansen 1973).

311 Forestry potential presents perhaps the most valuable aspect
313 of natural vegetation aside from food production. The total area of
all forest lands comprises approximately 26,000 acres which are con-
[423] fined to the islands of 'Eua and Vava'u. This resource is owned and
[655] managed by the government. However, it is presently of little
commercial value due to the problems of resource inaccessibility and
313 transportation of the milled production. Most activity in this